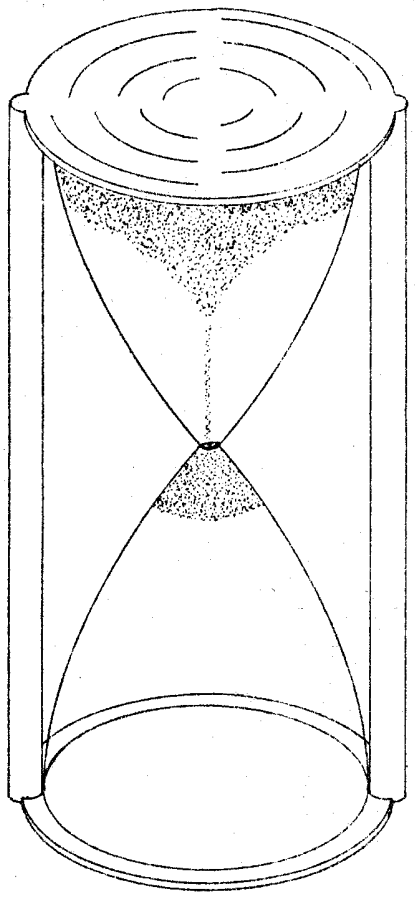
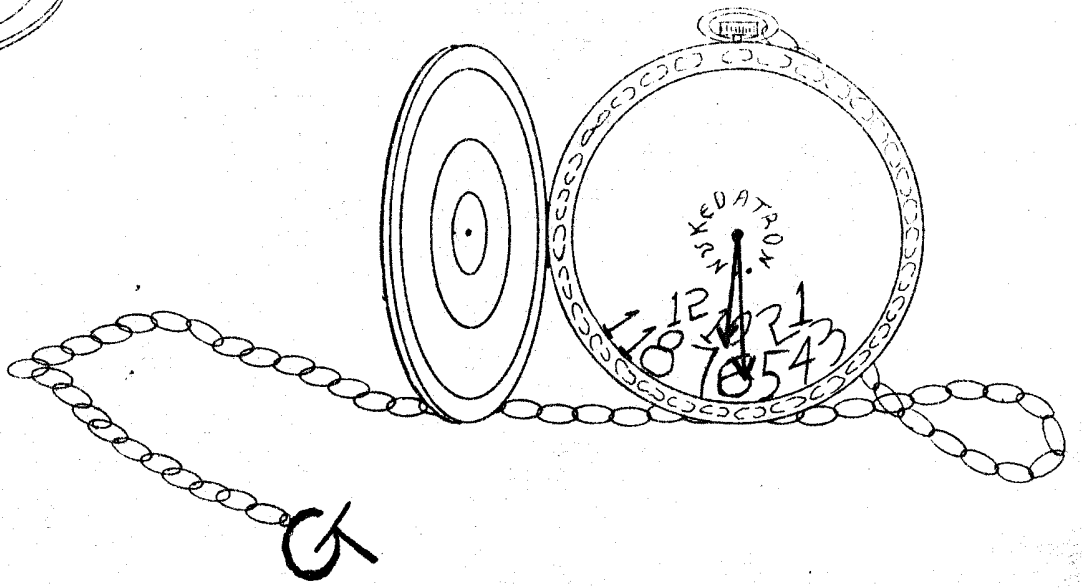
APATECH #25



FOURTH ANNIVERSARY



WELL, IT'S ABOUT TIME...

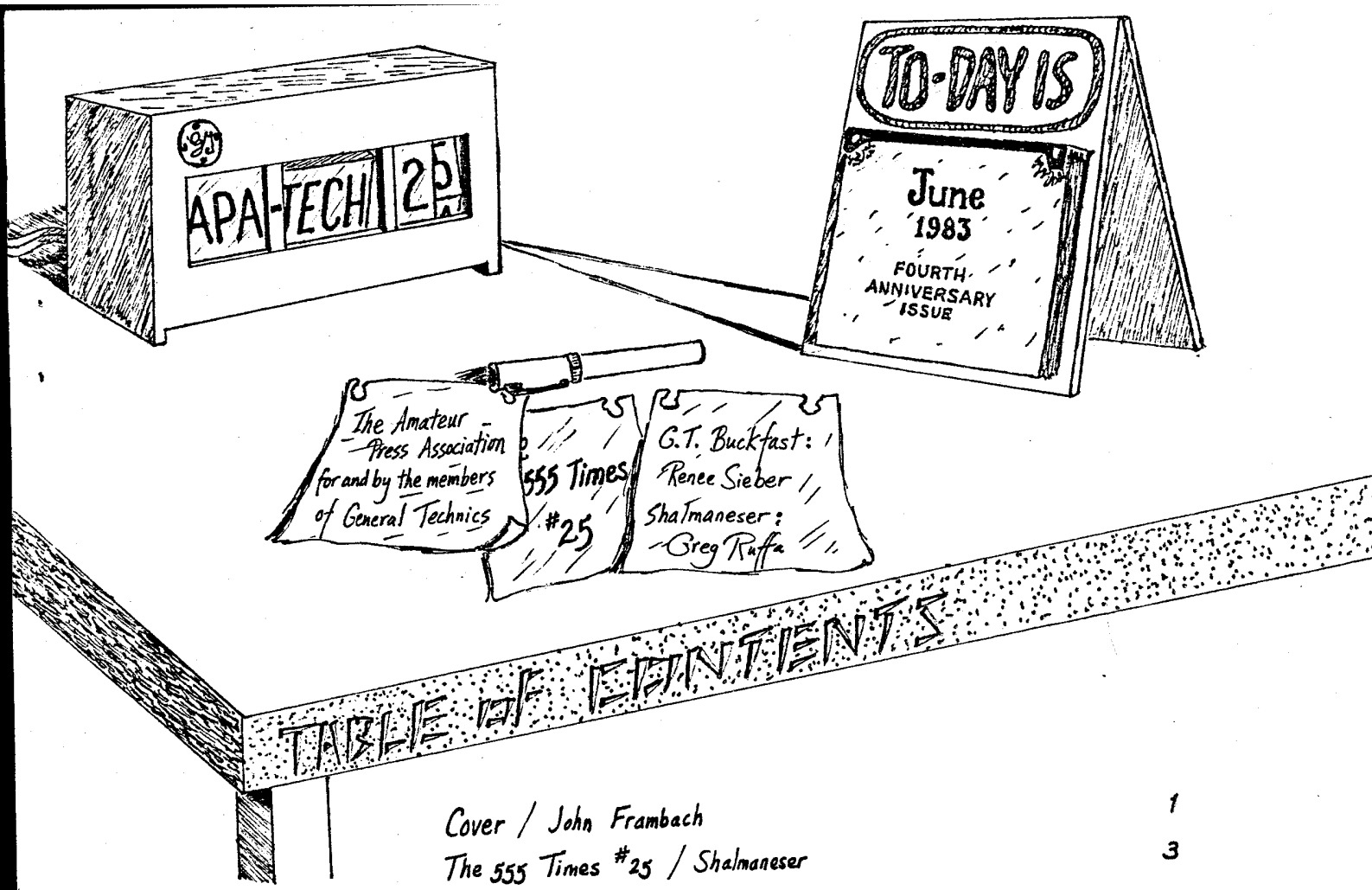


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The Quintessential Singularity #23 / Greg Ruffa		20
	total pages:	53

The number of copies of a contribution required is 30. The minimal sustaining membership activity is two pages or a cover every other mailing.

A sheet describing the history of your account prior to the posting of this issue is enclosed.

We are pleased to add Hugh Daniel to the roster.

The next deadline is Wednesday, August 10th at Jamie Hanrahan's address.

The Roster

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Rod Smith (7)	922 Belvoir Dr.	Frankfort,	Kentucky	40601 (502)-223-2119
Donna Struwe (19)	530 W. Walnut St.	Kalamazoo,	Michigan	49007 (616)-342-4967
Keith Thorne (1)	c/o Experiment 621, Fermilab, P.O. Box 500	Batavia,	Illinois	60510 office (312)-840-4144 home (312)-840-3288
Rolf Wilson (28)	302 Kenwood, #232	Champaign,	Illinois	61821 (217)-352-3840



Here I am again, this time to welcome the fifth year of APA-TECH. This is hardly the 30,000-page issue I projected it would be back some three summers ago, but I think we're continuing along all right, for the most part.

The OTB has asked me to announce one business item. The costs of Xeroxing, of envelopes and paper and ribbons and all the things that go toward the general administration and production of the APA have increased since 1979. Further, apparently the large stapler still isn't paid off yet. The annual dues are therefore being increased from $1- to $2-; the initial fee to join will remain at $2-.

Following this section is the traditional collection of indexes and statistics pertaining to the volume past. Contrary to my starry-eyed hopes of 1980, the APA did not come to embrace the full membership of GT (much less all the sentient inhabitants of the Cosmos). However, contrary to the fears of some, we ain't dead, either. It appears that we have subsided to a steady-state condition,

in which the roster contains somewhere around twenty members, who contribute an average of about sixty pages to each issue. (Curiously, the four-year history of contributions closely mimics the current cycle of solar activity with a time lag of about six months. I haven't the faintest idea what this means.)

What the graphs do not indicate is that the typical issue today is compiled from the contributions of less than half the active roster. I am quite happy with what has been coming in from "the regulars" (not counting myself), but it is a bit disturbing to discover that 52% of Volume 4 was written by four people. I'd like to encourage more of the members to write in more frequently.

This concerns me not so much for the sake of this APA but for personal reasons. As the members of GT continue to spread out across the country, the "social bonding" of the club is getting weaker. Many of you have expressed the feeling that "it's not worth writing anything this time because nothing interesting is happening to me right now." I assure you that what may not seem special to you would be of interest to us, just to know what is going on in your life. It is becoming increasingly common for members of this club to see each other only once a year or less. My experience has been that infrequency of communication tends to lead to its termination: people often put off writing to each other so long that they eventually give up entirely. (I don't offer this as a rigid rule, but as the observation of a common occurrence.)

I view an APA as a sort of group "open letter". It gives one the opportunity to write about your experiences and hear about those of N other folks without having to write N letters (it works out cheaper, too, for even fairly small values of N). It has been pointed out that two pages every other mailing comes to about a line a day. I would request, then, from those of you we hear little from that you write even just a one-page letter every second month and send it in, just to let us know how you are... (Sure, mailing comments would be nice, too, but one thing at a time.)

Well, we seem to be getting this thing out pretty close to schedule lately and there seems to be some interest in spreading the editing job around. Jamie Hanrahan has stepped forward (or did the rest of us step back?) to prepare issue #26, so please be sure to send your next works to Redondo Beach.

Enjoy the arrival of summer. I look forward to hearing from you next time. Happy Solstice!

Shal.

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#22 New and Improved Rabbit Runes 2
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#22	Sixty Pieces of Drywall / RHI #3	3
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ACCEFFFGHIR

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HG&R

#23c	APA-TECH 23	1

GHINR

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* * *

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_____ 22, Osbourne, 22cf via R. Smith, 1
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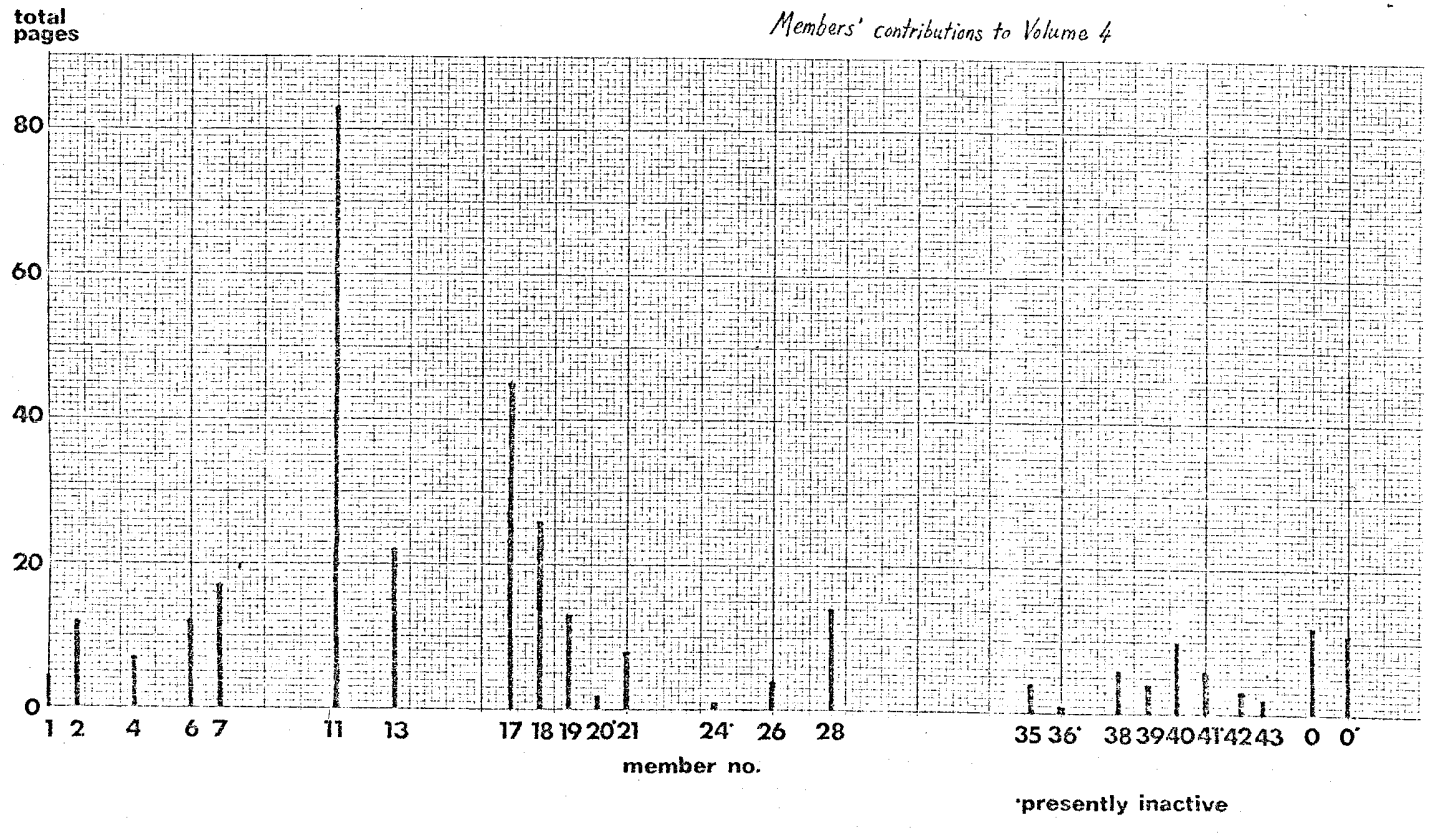
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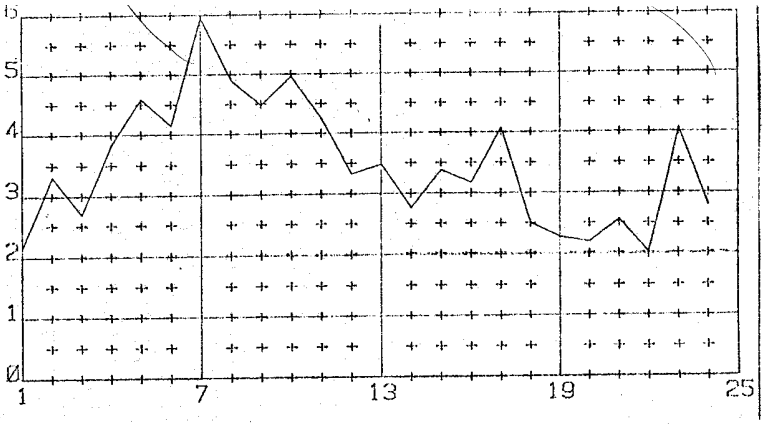
The Universe Runs Widdershins / The Jerry-Built Zine #7, Corrigan, 21, 2
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Welcome to Magic Mimeo Land, Levine, 19, 2
Well, Somebody Has to Do It, Flynt, 21, 3
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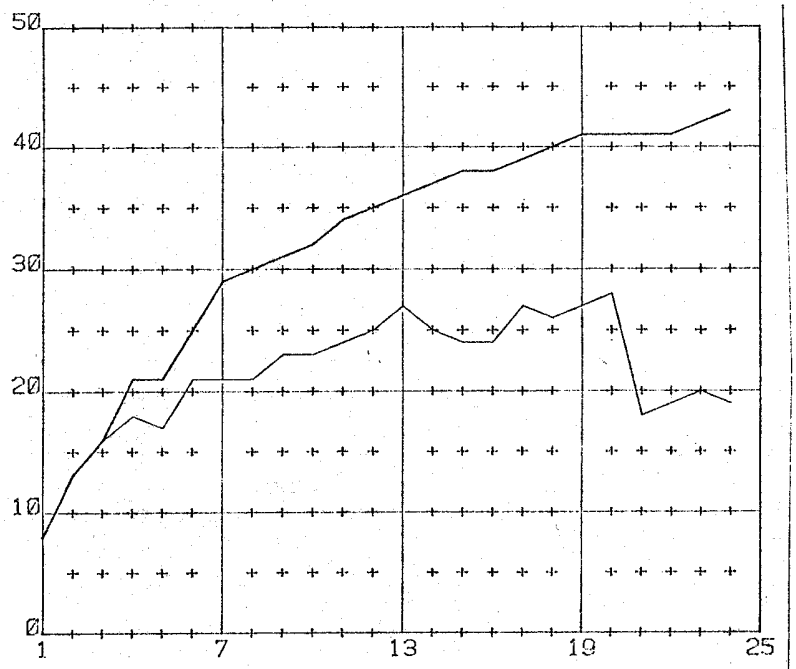
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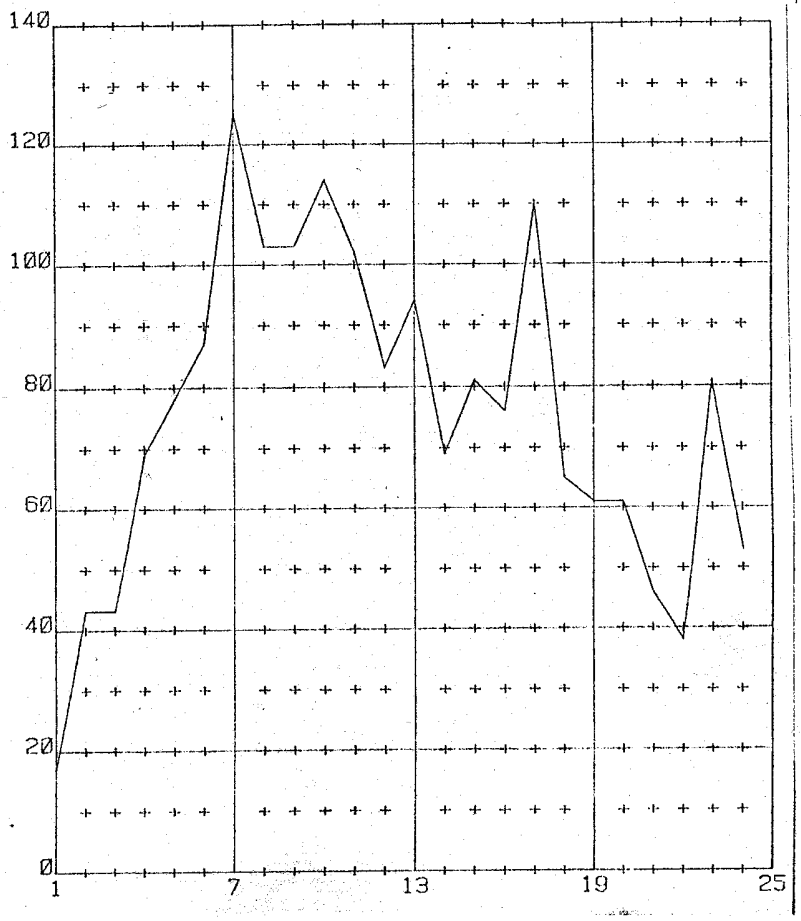
③ A graph of the average number of pages per member on the roster



② The top curve shows the highest membership number issued; the lower indicates the number of members on the roster



① A graph of the final number of pages in each issue of APA-TECH



produced on an HP 7221S plotter

THE K-LONG AND THE K-SHORT OF IT

is the current Apatech contribution of Keith Thorne, ex-war-profiteer and unsuccessful beach bum, who is currently a doctoral candidate in the stratosphere of experimental high energy physics. His various loci during the current period include:

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(612)373-5624

Experiment 621
Fermilab
P.O. Box 500
Batavia, IL 60510

Highrise: (312)840-4144
House: (312)840-3288

... and Cu-ca-man-ga!

KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK

Spring has finally arrived in the North Country. The trees have their leafy coats and the weather is finally in the 60's to 70's.(I may have spoken too soon. This past Memorial Day weekend has been in the cool 50's and rainy) I have been quite busy of late, what with my preliminary oral exam to study for and the department picnic to orchestrate. The fact that the picnic and the oral were three days apart didn't help matters. Not being a terribly social creature, I had never organized a picnic before, let alone one for over a hundred people. I got by by delegating most of the tasks to some of my fellow first-year students and it was apparently a huge success. I also managed to pass my oral exam,< Insert polite applause here> albeit not with flying colors as I would have liked. Alas, more delusions of competence shattered. As I am about to finish my final classes, all that stands between me and my PhD is my thesis experiment, paper and defense, which should only take a measly three or four years . . .(he said with a sense of doom and foreboding)

BACK IN THE SADDLE AGAIN

If my memory serves me right, this is the annish. Depending on how you look at it, I've either changed/done a lot, or not much, in the four years since the founding of Apatech. On the one hand, I've lived in Illinois, California and Minnesota, attending two universities and working in the real world in the process. On the other hand, at this time four years ago, I was also just finishing up my classes in graduate school and was preparing to spend part of the summer at Fermilab working on an experiment, just as I am now. Sigh, and I thought I was making progress.

As my list of addresses shows, my whereabouts have a high degree of uncertainty this summer. I expect to be at Fermilab starting the third week in June for an extended period. I will be back in

Minnie-land in late August-early September to move my belongings to storage, or to sell them. At one point I had a feeling that by acquiring household furnishings I could start to feel like I was settling down and becoming a real adult. I find myself now having an urge to get rid of all but the essentials (car, bicycle, clothes, guitar, etc.) and become a true vagabond physicist.(...wandering the highways and byways of small-town America, the quantum mechanic continues his lonely quest...) My plans for the fall are still sketchy, except that I will move more or less permanently to Fermilab for a year-and-a-half starting in December. I don't know exactly where on the Fermilab site I will be staying, but the phone numbers listed are a good bet to find me with. Bill Higgins may also be likely to know.

But this is enough gabbing. It has been a long time since I've made any mailing comments. Unfortunately, I have found my interest in topics issues wane rapidly unless I commit them to paper very soon after I read it. Thus items which at the time excited me may be sorely forgotten by this time.

MAILING COMMENTS (APATECH 23)

Cover - A great collaborative effort. I'm afraid it lost something in the transmission, however.

Donna - Long time no here hear. Your tales of Ishercon make me regret even more my having to pass it up this past year to study for my exam. Perhaps this coming January I can make it. I loved the E.T. "scientists ..." jokes. Re poor but happy: I am glad that you are at least the latter. Re weddings: Don't worry that it isn't big and fancy. Even my sister, who could have had a large, expensive one, opted for a modest affair at a local church, with the small buffet reception catered by the church's women's group. I thought it was very, very nice.

Greg - Re Millstone: And I suppose category four included the Earth, i.e. "mostly harmless", right?

True Confusions - Yet again these cartoons remind of all the great conventions that I have missed. Sigh.

Greg(again) - Re Niven: Personally, I feel that Jerry Pournelle is a bad influence, period.

Valli - Re title inquiry: I find the different versions to be amusing. A while ago I gave up the regular title bit myself. I must admit that this coincided with the end of my regular pubbing, too.

Greg(yet again) - Re Capricon: I see that their group memory is non-existent, as last year they used the large service elevator to get the pop to the con suite. At the Szechuan House, I stayed behind to take my ease and to finish up the leftovers. Yum! Re dead dinosaurs: We had a colloquium a few weeks back where it was claimed that many oil<u>g</u>as deposits may not be from dead plants, but are instead "organic" to the Earth, and that there is practically

an inexhaustable supply of it, if one only drills deep enough!

Andy - Your Los Alamos position sounds great. I have a friend from New Hampshire who would be very envious of your private ski run, as Minnesota is not the most mountainous of states. Re FTS: My current FTS number is 349-3239 at Minnesota.

MAILING COMMENTS (APATECH 24)

Cover - Really liked the cover, Steve, especially the "George TM". I prefer the title "RETURN TO THE ESCAPE FROM BENEATH THE BATTLE FOR THE JEDI", but that would be aping somebody else.

Rod - Re NASA budgeting: Similar things happen with other government research requests. My high-energy physics group has a deficit this year which is almost exactly the shortfall between our "barebones, maintenance level" request and what they then gave us. The fact that Congress never passed a budget last year didn't help matters, either.

Jamie - Re ct Donna re marriage: Personally I am all for the tradition of marriages and weddings, which should not necessarily imply traditional marriages, of course. Re ct me: Yes I did get the forms, and thank you again. I also got tax refunds from the feds and both states, so there.

Dick - Re confusing Confusion: I got my first whiff of this whole mess at Minicon. I'm afraid I am sick to death of fannish fueds and power struggles. Damn it, why can't these people argue over something that is actually significant. SF is supposed to be a hobby to most of us, i.e. a relaxation from the strains of the rat race. I wish people would keep such attitudes in the world of economic competition, where they might possibly belong, if at all.

Bill - Re boom town: Don't look now, but soon there will a Thorne in your side. Re ct Jamie re Worldcon dead-dog: Yes, as I now remember the couple was French, and they had a bottle of Icelandic vodka. Re ct me: I greatly appreciated your standing up for me at the E621 presentation. Gordon Thomson was up here the week afterwards and as he related the tale I relished thoughts of mysterious friends in high places. So how do I repay you?

Bonnie - Ah, so you have finally gotten around to joining the rest of us. Personally, I enjoyed your life story. I am also real envious of your "research trip" to the Virgin Islands. Now if only they would build an accelerator in Hawaii. Re musical beds: Your post-disaster proposal sounds like a sociological nightmare. At first I felt your concern over maximizing the gene pool was unnecessary, but recently I read where there is a real problem with the inbreeding of zoo populations causing a lack of vitality, i.e. poor health, sterility, miscarriages, etc. I think it would still be more crucial to establish stable relationships and groups in the first generation and solve gene-pool problems by ensuring inter-group marriages of the offspring. The success of communal arrangements is historically not very good. My views may, on the other hand, be influenced by the traditional men's fear of being cuckolded, i.e. the mother always

knows that its her child, but the "father" is never absolutely sure. Yearly rotations just play hell with emotions, and I don't believe any group is that mutually compatible inamongst each other. As for uneven numbers, there are the traditional methods of male combat, and of polygamy. Thoughts of turning such groups into continuous baby factories ignores the realities of requiring enough food, shelter,etc. to support such an increase in population. Keeping from starving would probably be the group's number-one priority, and any time spent child-raising would be a serious drain on this. There is no requirement that the world's poplulation be restored ass soon as possible. In fact, population growth may have been one of the causes of the disaster.

Renee - Again, condolences to you and Alex on his dad's death. I feel regretfully that I personally am pretty incapable of grief in the traditional sense, not because I repress it as much as I don't react that way. But it hasn't been tested much, either. I hope to be able to attend your house-warming this summer, if it comes off.

Greg - Re ct me re Bonnie: Now that she's in the apa, you can ask her yourself where her domicile is.

MY (last) SUMMER('s) VACATION - continued

-This story was left hanging in Apatech 23, so I better finish now.-

When last we left our intrepid travelers, they were just entering Yellowstone Park. That afternoon we drove around, visiting the Upper and Lower Yellowstone Falss, as well as a couple geyser areas. The sulfur stench was a bit strong at times. As evening approached we looped around the park and headed for Old Faithful. I was amazed to see electronic displays on the walkways around the geyser telling when the next eruption was expected to be. We got a seat on one of the numerous benches surrounding it and waited. It was a very creditable eruption and I got the request snapshots. We had dinner at the cafeteria of the Old Faithful Lodge and eventually drove back to camp. We crossed the continental divide at least three times that day, as well as covering about 75-100 miles driving around the park. I awoke to a cold nose, as the temperature had dropped to near freezing overnight. We hustled to stay warm as we loaded up and headed out of the park. The tree-filled gorge we wound through as we exited eastward was extremely beautiful. We passed through another procession of national forests as we headed through Wyoming. We breakfasted in Cody, and zipped across the high plains. There was another mountain range to cross in eastern Wyoming, and we chose a pass which took us through Shell Canyon. It is called that because of the tan-hued fossilized-shell rock of which it was made, which had a markedly different appearence from the previous heavily-forrested passes we had been though. We crested the pass at 9000 feet and then immediately wound down the other side. We headed south towards South Dakota and the Black Hills. The Black Hills are unfortunately a national forest, not a park, and are thus are poulated with all sorts of vile commercial exploitation tourist traps. We stayed long enough to see Mount Rushmore at sunset and headed onward. It was at this point that we encountered tthe first road signs for Wall Drug in South Dakota,

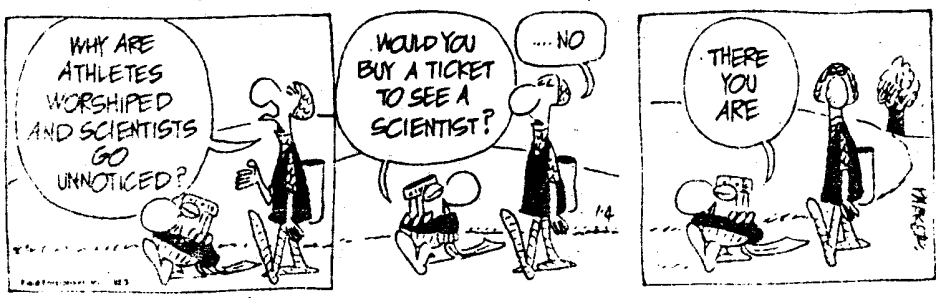
still 150 mile further on. I had been telling Bonnie all trip that we had to stop there, as it was a vital piece of Americana. As it was getting late, we pressed onward to Wall, South Dakota, and opted for a motel instead of trying for a campsite in the Badlands further on. The next morning we poked around the block-long edifice known as Wall Drug Store, looking at the various tourist-trap items and sideshows in back. We drove on to the Badlands, just taking enough time to drive through and stop at the scenic outlooks. Very dramatic terrain. We continued onward through the very boring Dakota farmland and entered Minnesota. As we turned north towards the Twin Cities, I encountered the obstacle of summertime road construction. We were ushered into town with the fanfare of a summer squall line. I oohed and aahed as it stretched majesticaly across our path, observing the dark, billowing clouds and incredible straightness of the front. You have to remember that it had been two years since I had experienced Midwestern i.e. normal weather patterns. We entered Minneapolis, where I promptly got lost on the one-way streets. Eventually we got a motel room near the Amtrak station, where we groggily went early the next morning to get Bonnie on a train to Chitown. I went back to the room and collapsed.

HEP TO H.E.P.

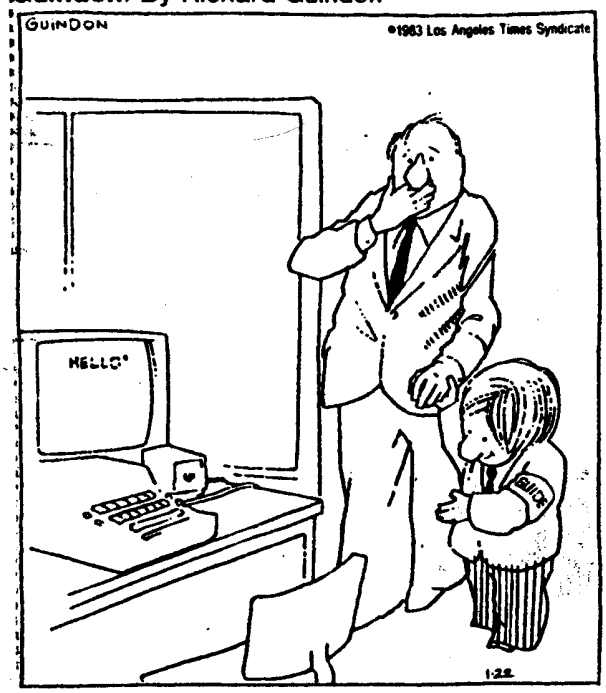
The world of particle phyiscs is alive recently. Our enemies at CERN have discoverd the W and Z vector mesons, carriers of the weak force and are rumored to have found the sixth quark, termed either "top" or "truth". My advisor has been the local instigator of efforts for the next "big" accelerator, termed by some the Multi-TEV-in-the-desert. This would be a 20 TEV monster which with cuurent magnets would need a ring with a 25-mile(!) diameter. A 2+ billion dollar construction effort! Needless to say, this is the biggest "plum" since Fermilab was fought over in the 60's. The requirements also are for an area which is flat to +- 25 feet, as well as being close to railroads and a major international airport. The Texans are hot in contention, with cheap desert land for its "Texatron". My advisor has helped propose to our high-tech-loving governor the idea of a "tundratron" bid, so a week ago he was calling up geology professors are drawing circles on a map of the state. We have swamp land to be used for it. The Texans seem ready to kick in big bucks for operations, while our only advantage is a very seismically stable area. We shall see. We did get approved to spend 7 million over the next few years to build "Soudan II", which is an upgrade of an existing proton decay experiment in northern Minnesota built and run by my group.

That about raps up this installment, except to say that this was produced on our department's new VAX 11/780, using EDT, and Digital Standard RUNOFF, as well as a Diablo Printer.

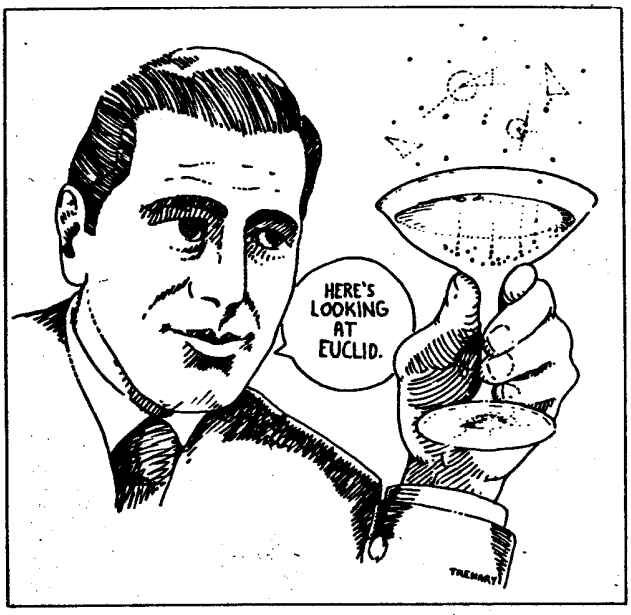
Wizard of Id/By Brant Parker and Johnny Hart



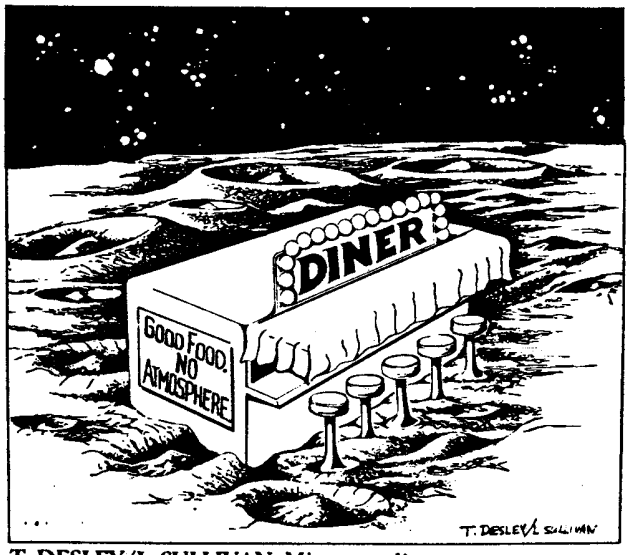
Guindon/By Richard Guindon



They are now using kid guides to help adults overcome computer anxiety.



ROLAND TRENDARY, Minneapolis

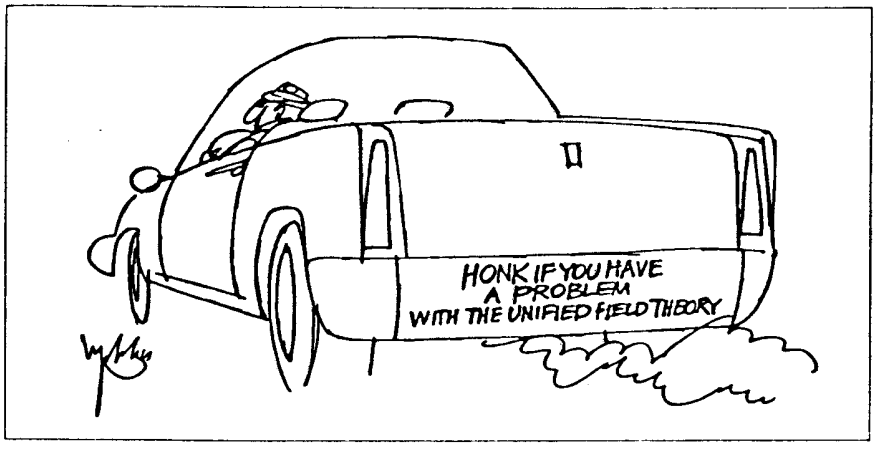


T. DESLEY/L. SULLIVAN, Minneapolis

WEDNESDAY, MARCH 23, 1983

QUICKIE REVIEW

This past week has seen the release of the RETURN OF THE JEDI movie. This one pushed many of the usual buttons, but I still failed to get into it. I found it nigh impossible to follow the battle sequences. The emperor had a bad case of gabby villian disease, making the psych. conflict unconvincing. Dickson should sue Lucas over the Hoka/Ewoks. I also dread the coming spate of more black jumpsuits, as well as overweight slave girls at upcoming conventions. Also, if Anikon is so tall why are his kids so short?



THE RISE OF THE HOUSE OF ISHER #5

(Maybe I'll think up another good title and use it for 5 or 10 issues.) Anyway, this comes to you from the apple of Donna to Apa #25. 530 W. Walnut, Kalamazoo, MI 49007. (616) 342-4967

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Comments on #23 and #23 1/2

Yes times - I never doubted that you can do it...I'd just like to see it a little more often.

A Foolish Consistency - I think I would be willing to host an issue at some point in the future - in fact, I think it would be a good idea if we all did it at least once, so that we know exactly what it takes.

Banzo's - Re yr survey - I like reading your new and different titles. I always have problems naming things, so I enjoy seeing other peoples creativity.//re our front door not working - it works now just as well as it ever did - but it never did work quite right. The wood holding the hinges is definitely rotting away and has been for years. Tullio never liked having it used, so we decided to lock it for good until we have the time and the energy (not to mention the money) to fix it, rather than being forced to fix it when it falls off of its own accord.//I hope that not having any crisis, and having a lot of relaxation means that you enjoyed yourself a lot. Hopefully that will be part of our standard recipe for all the future parties, too.

And comments on #24

A Foolish Consistency - re yr ct to me - just so that others know, yes, this was discussed elsewhere, and no, I don't intend to print what was said. Suffice it to say that we agreed that we were both wrong and that we were also both right.

Saw a Highway of Diamonds with Nobody on It - liked the ground beef//Now you'll have to convince Todd and Mary Lynn to join the apa to inject even more new blood (and that should give Renee a new and virtually untapped source for covers).//re the attic - it depends on what you mean by "finished". I doubt that it will be our electronics lab by then, which is what it will eventually be, but even now the drywall is almost all up (all but one section of one wall). The fun comes next, with plastering and smoothing all the cracks.//re our wedding - I don't know how you could ease our burden, but then, we haven't done much serious planning

yet. Our big problem is simply saving money. Right now we've got $ 700.00, and it looks like that's just enough to feed people (and that doesn't include drinks!).//re yr ct Rolf - Doc Smith's style does appeal to some of us. Right now I'm reading the Skylark Series to Tullio. (For those of you who don't know, I read to Tulio every night before we go to sleep - his choice of book, and then mine alternately.) He's read them before, but I never had. Sometimes things are a little hard to swallow, but they're fun books, and the Lensman series is even better. It would be kind of nice to be able to build anything that you need as soon as you need it - and the ships are always just that well equipped.

The Quintessential Singularity - re yr ct to me - any comments I make addressed to the 555 times, or the editor, are for whoever they apply to. I don't know about the rest of GT, but I believe that I am a fairly punctual person, and yes, it annoys me when other people are not. Also, no one was ever forced to become editor. I can understand that things don't always work out as planned, but I think that when someone offers or agrees to take up a responsibility, whether it is for love, money, or fun, they should then be willing to follow through and handle that responsibility. As I said, I can understand that things get pushed aside as more important things come up, but that should be the exception rather than the rule, or perhaps you should think twice about trying to shoulder that added responsibility. (I am not trying to shoot anyone down with these comments - they are simply the way that I feel about things, and I hope that no one feels offended by my remarks.)

********** ***** ***** ***** ***** **********

ANOTHER PROPOSAL (please read this - I think you'll like it)

Yes, another propasal, but please don't skip over it expecting it to be a reworded version of the previos ones - it isn't. I hereby propose that money be taken equally out of everyone's account to buy another stapler for the Shalmaneser (or anyone else who may decide to take up a considerable amount of the editorship in the future). Also, a question - what happens to money left in people's accounts when they drop out? For instance, I was talking to Steve Johnson about pyro, and he mentioned that Jeff had about $ 25.00 in stamps from him, and then he said that Renee had about as much money in his Apa-Tech account as well. He's not too concerned about getting it back, but I started thinking about it. Suppose Apa-Tech opened a savings account. Everyone's money could be kept in it, and the interest earned, as well as any money left by people who drop out and can afford not to care if they get their $ 5.00 back, could go into a "slush" fund. This fund could pay for such things as

the above mentioned stapler, and/or parties at cons (where a lot of us could attend - like maybe worldcon) for members of the apa. And maybe we could set a limit that no less then $ 10.00 should be in the account, to pay for any unforeseen emergencies. I don't think that this would add very much, if anything, to the accounting now being done, (please correct me if I'm wrong) and it would put the money to good use.

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The biggest reason that I didn't have any thing in the last issue was that I was typing something else. A friend of ours, Phil Meyers, wrote a dungeon a couple of years back, and TSR finally got around to looking at it a couple of months ago. They decided they wanted it, and asked him to rewrite some parts of it. Tullio suggested he print it out on our printer (since ours is letter quality and his isn't), and then Phil suggested that I type it. Since it meant a little more money I could put into our wedding fund, I agreed. It was supposed to be 65 pages, but now that I have the final draft it comes out to a little over 80. But I'm getting $ 100.00, so it isn't too bad.

Tullio and I had to go on a "marrige discovery weekend" a few weeks ago. It was kind of interesting. There were 11 couples taking it with us, and 2 married couples hosting. Basically we all sat in one big room, and the married couples talked about their marriges and some problems they had relating to the current topic (parenthood, careers, etc.). Then we were given questionaires, and usually 20 minutes to answer the questions by ourselves, and then another 20 for the two of us to get together and trade papers and discuss our answers. Most of the questions were things like "Now that you'll be living together, what chores do you expect to do around the house?" or "How do think your finances will be handled after you're married?" Of course, since we're already living together, we knew the answers to most of those type of questions. But we did get some insights into each others feelings about ourselves, our goals, our religious beliefs, and how we want to raise our children. We are at least in agreement as to how many children we want to have (the average 1.5). One of the married couples there has one child now, but wants to have about a dozen or two. I am very glad Tullio is not of that view. I can't imagine having 12 kids. They also have these weekends for couples who are already married. I think we may go to another one in a couple of years. It was really good for us to get away from the pressure of work and everyday life, and just spend a weekend really talking to each other. It almost seems sometimes that I talked to Tullio more when I was living in Chicago - we didn't have to worry then about all the mundane details that create everyday living. The weekend put a little of the romance back into our life. And it also helped me decide to start working my

way back to my church. That may seem a strange statement from one who is "living in sin", but I intend to try to become a better Christian, and from that, a better person, and a good wife for Tullio.

++++++++++ +++++ +++++ +++++ +++++ ++++++++++

Well, one of my ten year predictions has already come true. Isher is now our only means of support. We are working mostly on some proto-type fittings which Tullio's father invented. But, the economy must be picking up too, because we've gotten what seems to me a record number of mail orders this month. So much money has come in, in fact, that we've been able to open an Isher savings account. We've wanted to for some time, but never seemed to be enough ahead of all the bills and expenses. We're making enough money at the present time that we now have to file quaterly withholding taxes (which doesn't thrill me, but having the money is sure a lot nicer than worrying where our house payment is going to be coming from). I'm not sure how long this fitting project will last, but its allowing us to put a little money away, too. This may sound like we've at last made the Isher fortune, but in reality we're very far from that. But considering the fact that when last I wrote our income was virtually nil, I sure feel better about things now. We're not poor anymore, but we are still happy - in fact, we're even happier then we were last time I wrote, due in part to our weekend away.

Our convention schedule is very low this year - we've decided that we can not afford to go to the same conventions every year, especially ones as far away as Minneapolis. We're considering a 2 or 3 year rotating schedule for hitting the standard midwest regionals. We do so much better at conventions in cities we either haven't been to in a couple of years, or where we've never sold at. Toronto is one city added to our usual circuit - we did great there last year, hopefully this year will be a repeat performance. With this system, there will probably be less cons that we attend where all of our friends are, but with luck, and planning, we'll be able to schedule some "fun" cons - ones that are close enough to home that it won't matter too much if we only make expenses, and at these cons our main purpose in attending will be to see friends and have a good time, as opposed to making our living.

!!!!!!!!!! !!!!! !!!!! !!!!! !!!!! !!!!!!!!!!

We were given a little booklet designed to help couples pick out readings for their wedding service. Do any of you know any readings which might be appropriate for our wedding? We've picked out some, but we're still looking for more. We want something that will fit in traditionally, but still be a little

different. Probably just about anything in the Bible has already been read at somebody's wedding, but what we really don't want are the ones that are read at everybody's wedding. So if you've got any suggestions, I'd really like to hear (read) them.

////////// ///// ///// ///// ///// //////////

Well, we've statred falling into the mainstream of life it seems, with things like going to church on Sunday becoming a part of our weekly routine, and we bought a tennis racket for Tullio, so we can start going out with the jet set on the courts. My parents gave Tullio a membership to the NRA for his birthday (and that is not the National Raygun Association). He also joined a gun club here so that we can do some target shooting with the Winchester 22 rifle we just bought. (You all wanted controversy - is this what you were looking for?.) Eventually we both hope to have lifetime memberships to the NRA, which my father and both my brothers already have. I'd also like to get a revolver for myself sometime in the future. And we decided what to get for my dad for father's day - a sign that says "never mind the dog - beware of the owner".

?????????? ????? ????? ????? ????? ??????????

Linda has graduated, and I believe is now back in Chicago. (Linda is my sister, and was once a fan (and may be one again now that she's back in the big city - I don't know about that) for those of you who may not already know.) I understand from my father that she's sent her resume to various places including one in Washington D. C. and Utah. If you know of anyone who needs a mechanical engineer, let her know. Of course, I got all this from my dad, so I don't know how hard she's looking, or if she has some good prospects, or even a job already. Hopefully now that she's back at home I'll get to talk to her a little more. Neither of us could afford phone calls while she was at school, so I only got news of her through my parents. I haven't even seen her since Thanksgiving, since she left for Japan to meet Yas's family on Christmas day, and Tullio and I came back from Florida on the day after Christmas. But now that she's back in Chicago, maybe we'll get to talk to each other if not see each other for awhile.

&&&&&&&&&& &&&&& &&&&& &&&&& &&&&& &&&&&&&&&&

Well, that about wraps it up for now. Have fun, and be happy.

Donna

TRANSPORTER TOPICS

21

Rodford E. Smith
922 Belvoir Dr.
Frankfort, Ky. 40601
(502) 223-2119

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TT COMES OF AGE

Yes, with this issue Transporter Topics is twenty-one. For those of you who thought is would never last: Nyaaaahhh! Flowers nad congratulations may be sent to the proud father at the above address.

REQUIEM FOR A LANDER

Alas, Viking lander one is down, with little hope of revival. While trying to reprogram the battery charging sequence it seems that the controlers accidentally wrote over part of the antenna-pointing instructions. Now they don't know where the antenna is pointing. They were going to try one last effort, using a humongus pulse radio beam to try and get the lander's attention, but I haven't heard how this turned out. The people in charge were not optimistic about their chances of success.

DRIVING

Have you ever noticed how a person's whole personality changes when they get behind the wheel of a car? I lnow that I am no exception. I think that a large part of this is the social isolation. Drivers are anonymous, and this, combined with being in charge of a ton or so of insensate, active matal gives people a feeling of power. There is also the fact that being inside the car cuts a person off from several normal sensory clues. Your eyes tell you that you are moving, but there is little muscle activity. This provides a sense of unreality, which isoloates and insulates the driver from the act of driving. Small wonder that the great majority of accidents occurr from people simply not paying attention.

Speaking of driving, I saw something interesting the other day that is so simple that one wonders why it was not thought of before. It was a flashing strobe on the rear of a school bus that activated when the bus stopped to load or unload. That ought to help break through the fog of early morning drivers!

WAY TO GO, GEORGE!

George Lucas has ordered 50,000 new "Revenge of the Jedi" posters printed to foil would-be scalpers who were going to sell the originals at exhorbitant prices.

THROWAWAY

Mathematics is a crutch for those who can't visualise properly.

EMPLOYMENT

I recently saw a listing in the Kentucky state government Job Bank for a job called "Environmental Engineer." I have applied for it. It is four steps up in salary grade, although the most that I am likely to get if I land this job is an immediate 5% raise that all employees who transfer get. If I do get this job it will mean a greater potential for advancement. I have been at my current job fot five years,now, and it is beginning to look like it is a dead end. What is funny is that one of the assistant directors where I now work, whom I have know for several years because his daughter and my sister were best friends, called me into his office a couple of days after I submitted my application and suggested that I might want to look for a better job, since I was now a registered professional engineer. I guess great minds work alike.

SURVIVALISM

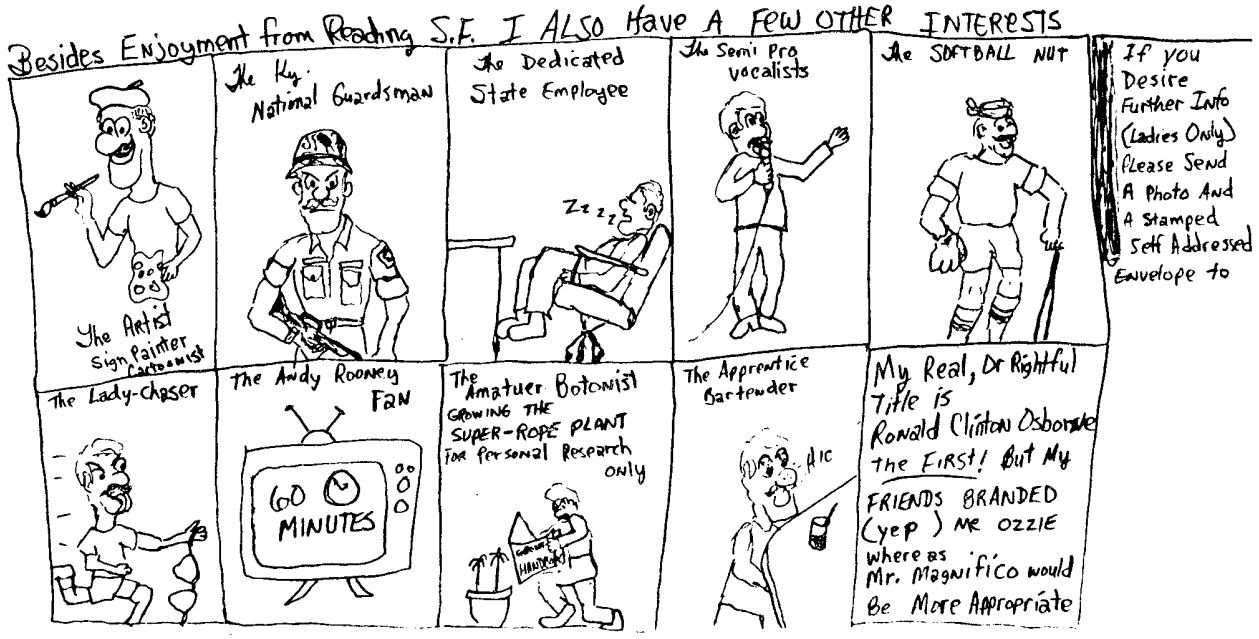
I had a great time at Marcon this year, but others are much better at convention reports, so I'll let them do most of this. However, shortly before I left to return home I was in the dealer's room with Bill Higgins and Gregg Ruffa. We were looking at used books, and happened to see some copies of "The Survivalist" series. One of them happened to make some sort of remark about the breed of suvivalist who runs around in the woods in cammo coveralls playing soldier. Now, I am a survalist, at least of a sort, and I told the others that these individuals were a small, very eccentric minority in the movement. A survivalist is, simply, someone who takes precautions against emergency situations. Someone with a well-stocked first aide kit in their car is one, whether they know it or not. In the days before instant gratification of our needs by technology nearly everyone kept food stores around. They had more than they should acctually need, in case of trouble of some sort. Today, people seem th think this is unnecessary. However, emergencies still happen. The past few years in the Frankfort area we have had tornadoes, floods and a truck strike. Some of these were merely inconvenient, others major catastrophies. We have also had major snowstorms, which are not very endangering to those who stay at home, but which can cut off access to the outside for days. Those who prepare for such troubles, keeping stores of food on hand along with alternate sources of light and heat, have far fewer problems than those who do not. In some cases these stores may mean the difference between life and serious injury or death.

MOVIES

I have seen acouple of SF films on TV recently that have a very good feel about them The first is "Death at Station Zeta", or something close to that. It had a very Star Trekins- feel to it, although the plot was a standard monster movie. It was good but predictable. The other was "Life Pod", and was something different from the usual space western being churned out these days. It was a drama, rather than an adventure or action film. Very well done, understated but not dull or dragging. A firearm was used only once in the whole film. I liked it.

MAILING COMMENTS

Now for what evarying has been waiting for with baited breath (that's bated). But first, a word from our sponsor.



Foolish Consistency: Regarding your comment to Rolf, what's so hard about getting a tax refund. Anyone with an IQ oaver 80 should be able to understand the tax forms. After all, they were written by people with like scores. Of course, having a CPA in the familly helps.

Dick Smith: RAEB too short. Don't blink or you'll miss it.

Bill Higgins: what do you mean the fire hazzard was too great? (Says he, referring to Babbage's efforts in stage lighting.) Gas light is far more hazardous that limelight. Just watch the appropriate episode of Connections. As I recall from other sources, there were several episodes of actors accidentally setting themselves of fire by getting to close to the front of the stage. Not to mention the fact that all that piping could develope leaks. Limelight had its gas source at the light, eliminating much of the dangerous pipe joints. Limelights were probably rejected for the same reasons that the military first rejected steel cannon to replace bronze and iron. It was new.

Your repro faded through. Shame on you.

About Geothermal power in Indiana: if you dig deep enough-------

Bonnie Jones: Hello, Bonnie. Welcome to the madhouse.

About your genetics question: are you aiming for short-term or long-term genetic diversity? For long-term the traditional family system works well. Also, you have a problem in that children of opposit sex who are brought up together do not see each other as sexually desireable. So your third or fourth generation of communal living could cause problems. Don't worry too much about odd numbers of people. In large groups there are always hermits and people who are not interested in settling down to form a family. Also, there will always be people willing to share. You would have mostly couples, with a few singles and triples, and maybe even a few quadruples. Try reading "The Moon is a Harsh Mistress" for examples of family types.

Renee: My sympathies to you and Alex. Yes, life does go on, and grief fades slowly. Hopefully, memory never will.

Idiot isn't dumb. She's gettihg you to do all the work, isn't she?

Greg Ruffa: All this precipitation comes from the large amounts of volcanic dust in the air.

Automatic transmissions have a safety interlock that privents the starter from engaging unless the shift lever is in Park or Neutral.

Regarding your comment about speaking cars, did you hear about the woman who drove into a telephone pole when she heard a strange man's voice in the car? She had forgotten that it had the new talking warning system.

I like your covers. Looks like Bill took a typed sheet and photocopied it, then turned it slightly and re-photocopied it on the same sheet.

Canadian Study Says VDT Use Should Be Limited to Five Hours a Day

A recent study by the Canadian government recommends that Canadian businesses allow employees to use video display terminals only five hours a day until federal regulations are formulated.

The government is concerned that radiation leaking from terminals could cause abnormal births, injury to eyes, and other health problems. Similar concerns have been raised in the United States.

The Canadian study group, appointed by Labor Minister Charles Caccia in March, noted the difference between reports of abnormal births to VDT users and the findings of scientists and medical researchers who say there is no evidence of health hazards from VDTs. The study group was told during its inquiry that of six children born to VDT operators at a hospital near Vancouver, British Columbia, only one was a healthy, full-term baby.

There were also reports of problem pregnancies among women working with VDTs at the *Toronto Star* and in a federal government department. Murray Hardie, director of the task force, said tests indicate VDTs emit extremely low levels of radiation, but whether such low doses can cause birth defects remains a matter of controversy.

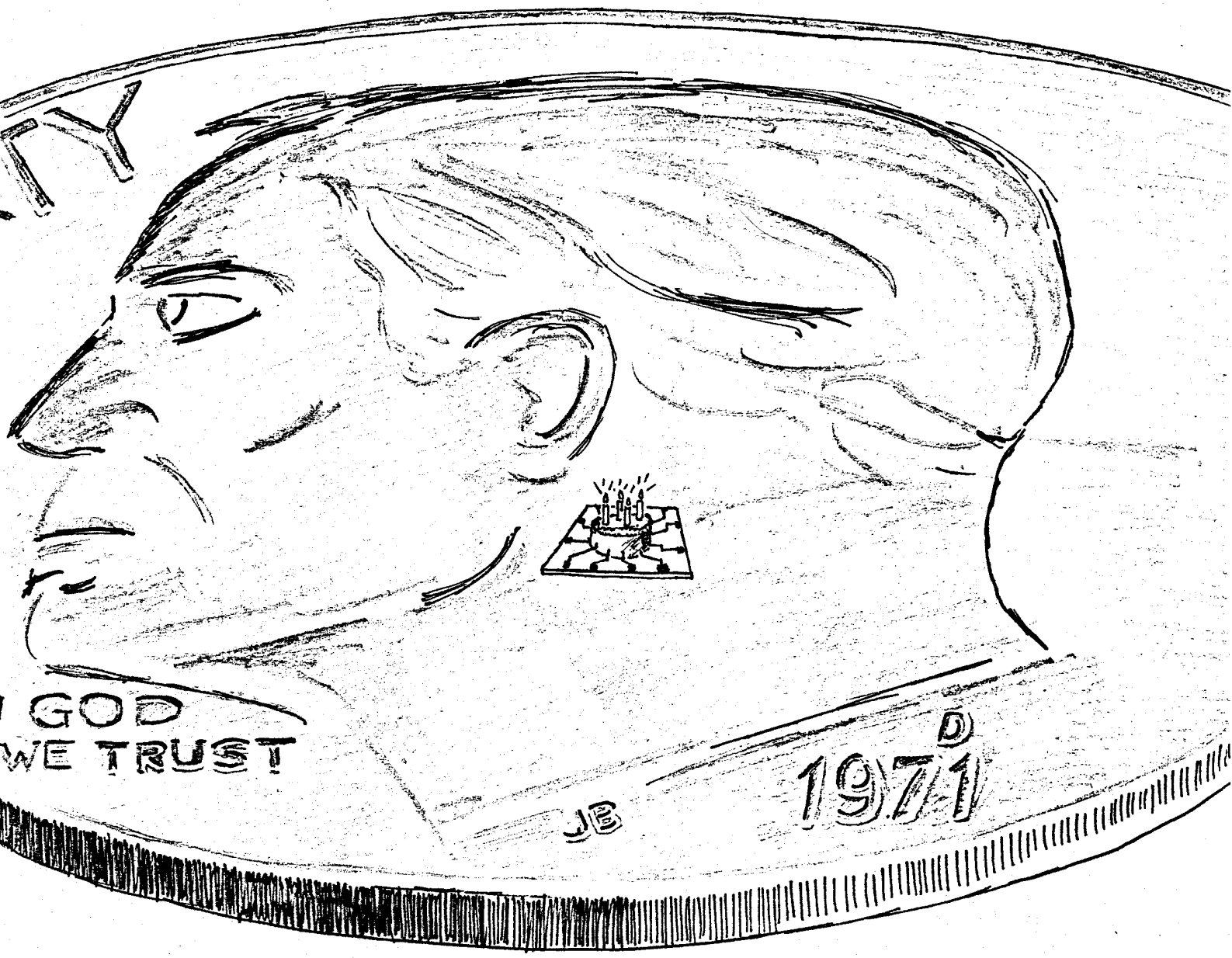
The report urged the Canadian government to continue to finance research on possible VDT health problems and to develop safety standards. Until these standards become law, employers should voluntarily restrict daily VDT use to five hours, pay for eye tests and corrective lenses, and agree to reassign pregnant women to jobs away from VDTs—without loss of salary, the study says.

According to the Computer and Business Equipment Manufacturers Association, however, the fear of radiation from VDTs is unwarranted. Vico Henriques, association president, recently told the Connecticut Legislature that VDTs emit less infrared, ultraviolet, and X-ray radiation than fluorescent lamps, space heaters, and television sets, citing studies by the Food and Drug Administration and the National Institute for Occupational Safety and Health.

The New York Committee for Occupational Safety and Health has stated that in this country, "very limited testing by government and industry has been done and the conclusions of the tests have been challenged by unions and independent health specialists."

Newspaper Guild President Charles A. Perlik Jr. said that the only way to be sure the machines are safe is to test each one, and in businesses, such as newspapers, they should be tested by an impartial third party. #

QS24



**New GT-developed "birthday chip"
permits celebration density of 3.8 millenia/cm^2**

the Quintessential Singularity 24

22 May 1983 **for APA-TECH 25**

being a journal of complex, imaginary and irrational studies
produced by the Center for Spaced Research, a division of Ossa-on-Pelion
RR 1, Box 390, Apt. 5, Hamburg, New Jersey 07419 (201)-827-6111
Gregory Ruffa, Director and Satellite-slayer

Ossa-on-Pelion Headquarters: 1220 Lenape Way, Scotch Plains,
New Jersey 07076 (201)-753-9207

The councilmen at the county seat in Newton have asked the Federal Government to declare Sussex County a tropical rainforest.

Congratulations to GT for APA-TECH's attainment of a fourth anniversary and for the revival of Pyrotechnics.

* * *

I'd started this out once already with some crabbing about it being the thirteenth consecutive rainy weekend, but that was a week ago now and I'm in better spirits. Now it's the 11th of June and has been sunny (though a bit humid) for three days running. So I thought I ought to change my opening to express a bit of gratitude to the Weather Operators (who have decided to get with it and stop cruising in neutral with their lights out).

Not much is new with me since I post-mailed last month; there is a lot of space news, however, which is why this issue is filled with more than the usual amount of material swiped from various sources. My mailbox this month has been graced by mail from Los Alamos National Laboratory, Digital Equipment Corporation, Fermi National Laboratory, and, er, SieberNetics*, all of which has lent a certain aura of prestige to the address of the ol' CSR. Now if only the postal carrier understood all this other weird mail I get... I finally learned and tried out RUNOFF on our PDP-11/70 at work; that accounts for the difference in appearance of the "Poles" section. I cannot say that I am fond of the dot-matrix typeface, but our promised "letter-quality printer" has not yet materialized (nor is it likely to do so: at Glenwood, I put my faith only in that which has already happened). That's all right, though -- I expect to have something pretty nice by next issue.

The Flying Eggplant's radiator blew out on the way back to Hamburg last month; I spent a rainy morning in Denville waiting for the garage to perform a couple tube-otomies. I just had the re-rebuilt transmission looked over: it seems OK, but we found the engine's hot-air return hose lying at the bottom of the engine compartment. All I still have to do now is get a couple minor repairs and replace the radiator and a threadbare tire (with nothing too good) before I'll feel right about selling it. I'm about to enter the throes of auto-shopping, but that probably won't be settled until August.

Work is right back to normal again and probably will be until around November. We shut down the telemetry transmitters on Westar-I at 4:04:07 PM EDT on June 3rd; it should have gone over the horizon by the morning of June 14th. (It'll pop back up in the east sometime

* oh yeah, and Woods Hole Oceanographic Institution via Kalamazoo

in October, but we're not going to look for it...) Evidently, the company decided not to spend money on a "wake". In the re-arrangement of the control room, we now have a $4\frac{1}{2}$' x 24' white space over the equipment bays. One of the folks at work knows an art student who has done some science-fictional art; if WU comes up with the money, we may get an astronomical mural sometime this year. (Again, I'll believe it when...) Westar-V passed its first anniversary on June 8th (yay). We're still pretty sure that Westar-VI is going up on STS-11 (Aviation Week thinks so, Satellite Week thinks so, Arianespace doesn't think so). Regardless of the launch vehicle used, Hughes will be directing the launch from their Galaxy facility in Manhattan Beach, California. My colleague will be going out to L.A. this winter with a few other WU observers to watch the launch; I'll get to go out for the rehearsal about six weeks earlier. So it looks like I'll be in Southern California again in November or December.

* * *

Marcon was a rather quiet experience for me this year. Even fewer people I know showed up this time. I got in myself around two in the afternoon and spent the afternoon reading until Rolf and Mary arrived. We had dinner at Farrell's -- no ice-cream extravaganzas were staged. They spent a good part of the evening recuperating from their trip, while I roamed around waiting for someone else to come in. Dick Smith showed up about ten; Bill-El and Jerry, who were staying with me, came in somewhere after midnight. My roommates and I visited the con suite and some of the parties for a while before retiring.

Saturday morning, the five of us piled into Jerry's luxury yacht for the Economic Suicide run. The first stop was the Village Book Shoppe (or The First Church of Remaindered Items). Among other goodies, we bought out their inventory of H. Allen Smith's The Compleat Practical Joker. A couple of appropriate opportunit es were missed, such as sending someone on a wild-goose chase by saying, "Hey, I saw another copy of Smith in the next room!" Jerry did warn me to check the title page on my copy before we left the store. Then there was the obligatory visit to the French Market for a bizarre assortment of lunches before making off with pastries, cashew brittle and the like. When I got back to the room, I heard a familiar baritone voice wafting from the bathroom; Higgins and company had pulled in about 2 AM, just after we'd all gone to sleep. I spent a large part of the evening viewing animation (that sounds so much more dignified than "watching cartoons") with Rod Smith and others. There was a smallish GT gathering in my room, mostly talking and doing a couple of numbers. There weren't enough people to bother buying refreshments for, so we all wandered down the hall to the hospitality area. The con suite was giving away soda and helium balloons; we went into the lounge next door, where it was quieter, and found bubble solution. Soon, amidst ecstatic helium-cackles, folks were blowing air-helium bubbles in a spectrum of densities (some float down, some float up, some just kinda hang there) and levitating or detaining them with static-charged hair combs. A really large bubble accelerator was planned for the New Mexico desert; mass-to-charge ratios were measured; a monograph on "Soap Bubble Mass Spectroscopy" was drafted.

Sunday, Bill-El, Jerry and I had the Quality Inn Brunch, which was quite good and well worth $8. After the rooms were evacuated (which cleans out all the loose dirt, but takes the furniture along), we went to Steve Johnson's house for the annual barbecue. This year, we had to huddle under the eaves to avoid the downpour, but the hospitality was adequate compensation. In all, this was a pleasant visit, although with a narrower compass of people than usual.

I guess Constellation has finally gotten around to telling all of you where you'll be staying. I'll be at the Holiday Inn Downtown; if I offered you space, please let me know because I don't remember if I have any more room or not.

* * *

Space-related activity is really picking up right now. Both Ariane 6 and STS-7 got off all right. The Hughes people are going crazy because they have to supervise the Palapa launch from the Shuttle, their own Galaxy satellite on June 28th, and AT&T's Telstar 3A on July 28th. Our next launch is on STS-11: the media are starting to confirm our bail-out from Ariane, which means we will sacrifice our deposit (it works out the Shuttle is still cheaper, but we wouldn't have minded getting the $7 million back).

NASA has the IUS failure on TDRS-A pinned down; now they just have to figure out how to solve it. Because of that problem, the Defense Department cancelled out of STS-10, leaving a nearly empty cargo bay; unfortunately, we won't be ready enough to step into it. TDRS-A itself was in a 22,198 x 21,502 mile orbit on June 21st; the target is a 22,236-mile-altitude circle over 41° West, which NASA thinks they'll reach at the end of this month.

I picked up some interesting phone numbers. The "dial-a-Shuttle" number, which taps into the live communications, is 900-410-6272. Johnson Space Center has a tape recording on the mission status, which they seem to update every couple orbits, that you can call at 713-483-6111. Goddard Space Flight Center got so many phone calls about TDRS that they set up a tape, updated daily around noon: call 301-344-0893. I just tried these numbers and they all work.

Among the enclosed clippings is a blurb on magnetoplasmadynamic thrusters. What is exciting about them is that they deliver exhaust velocities comparable to ion thrusters, but can use common gases as reaction mass instead of scarcer heavy metals. There was a real battle about launch systems at the Paris Air Show, so I reproduced most of the report. Since Wheelon at Hughes mentions the coming HS-393 model (which will be, among other things, the incarnation of Westars-IX,-X,-XI, etc.), I've copied some material I filched from one of their design documents ("Stolen government training film: Air Force generals ONLY!").

The Infrared Astronomy Satellite found another comet all by itself. It was just a bitty one, which now leads some people to feel that there may be faint comets going by all the time. This may go some way toward explaining why we've seen comets crash onto the Sun more often than anyone ever expected. This may in turn mean that the chemical composition of the solar surface is not representative of that of the interior, which may in turn help solve the solar neutrino "problem".

Oh yeah, and the Russians are on the way to Venus with a pretty good radar imager; they'll be there in October. Gotta go. Hot boards!

IUS Flight Test Failure analysis on the U. S. Air Force/Boeing inertial upper stage that placed the Tracking and Data Relay Satellite TDRS-A in the wrong orbit shows the booster had so many problems that NASA is studying launch of a shuttle with an IUS test booster carrying a dummy payload before committing another TDRS spacecraft to the upper stage. Marshall Space Flight Center has been asked to study the possibility of flying a test IUS to reverify the booster's performance. Multiple software problems and thrust vector control difficulties are being viewed as a likely cause of the Apr. 5 second stage failure following deployment from the orbiter Challenger. NASA hopes if a test mission is flown it could be launched within the next 6-10 months. The only shuttle missions available to fly a test are Mission 8 in August, which was to carry an IUS/TDRS; Mission 10 in November, and Mission 12 in early 1984.

'Beyond the Global Village'

WORLD WITHOUT DISTANCE, COUNTRIES WITHOUT WALLS

"Radio waves do not recognize frontiers," and it's useless for countries to try to "prevent spill-over," Arthur Clarke, celebrated father of communications satellites, told United Nations last week. Clarke joined Intelsat head Santiago Astrain at podium for speech celebrating World Communications Year, told delegates they could do nothing to prevent free flow of information and shouldn't try.

Communications satellites have "created a world without distance, and have already had a profound effect on international business, news-gathering and tourism," but impact has "barely begun," Clarke said. By end of century, he predicted, "they will have transformed the planet, sweeping away much that is evil and, unfortunately, not a few things that are good." Millions of miles of copper wire can be replaced by "handful of satellites in stationary orbit." Portable radiophones, wristwatch telephones & attache-case-sized units allowing 2-way communication via satellite all feature in scenario, he said.

Not only will news media not be at "mercy of censors or inefficient postal & telegraph services," Clarke said, but "it means the end of closed societies" and ultimately, (quoting Toynbee), "the unification of the world." To chagrin of policy makers, debate over free flow of information "will soon be settled — by engineers, not politicians, just as physicists, not generals, have now determined the nature of war," he added. Implications are "enormous, and will change the nature of society... No government will be able to conceal, at least for very long, evidence of crimes or atrocities, even from its own people." In long run, everyone will benefit: "The very existence of the myriads of new information channels, operating in real-time and across all frontiers, will be a powerful influence for civilized behavior."

Clarke used examples to illustrate fact that politicians were guilty of "talking technological nonsense" and even some hypocrisy in efforts to regulate radio waves: (1) In 1976, beam from ATS was slanted towards India for maximum signal strength there, "yet good images were still received in England, a quarter of the way around the globe." (2) Radio amateurs in Clarke's adopted home of Sri Lanka have been receiving pictures from Soviet EKRAN satellite: "Thanks to them, we were able to enjoy the Moscow Olympics."

What Clarke called "electronic cultural imperialism" will take with it both bad and good, "yet it will only accelerate changes which were in any case inevitable" and may even serve to preserve for future generations cultural expressions in way not possible in earlier age.

Astrain concentrated his remarks more on communications as they exist today, illustrating dramatic growth of Intelsat over last 2 decades. He emphasized role Intelsat has played in developing countries, said: "It is increasingly clear that low-cost, reliable, effective communications is one of the most powerful forces for economic development in the world today"; recent studies in Kenya, Egypt & India "have frequently shown a positive cost/benefit as high as 100 to one."

Astrain cited Arthur Clarke Centre for Modern Technologies in Sri Lanka as "one example of progressive thinking that is needed at this critical time in the development of space communications." Recently, scientist and engineers initiated new U.S. foundation and advisory committee to support Clarke center. Intelsat spokesman said effort wasn't endorsed officially by Intelsat but had support of many individuals in organization and other leading communications professionals. Center, according to communique from Naren Chitty, Counsellor of Embassy of Sri Lanka, "will seek to develop and adapt new technologies appropriate to the needs of developing countries, to establish a base for joint ventures in high technology, and to train scientists, engineers and technicians in such fields as communications, computers, alternative energy sources, robotics and artificial intelligence."

Flying Boat unveiled as exhibit premieres

OK, gamers, keep an eye out for the BIG airplane...

The world's largest aircraft, Howard Hughes' Flying Boat, was unveiled last week in its Long Beach showcase inside the world's largest geodesic dome.

The Flying Boat was the centerpiece of ceremonies marking the opening of the Wrather Corporation's newest exhibit, which is located adjacent to the Queen Mary.

Among the celebrations was a "Howard Hughes Commemoration" night to honor the industrialist, aviation pioneer, and founder of Hughes Aircraft Company.

The evening was hosted by the Los Angeles Section of the American Institute of Aeronautics and Astronautics with the assistance of the Wrather organization. Master of ceremonies was newscaster Clete Roberts. Approximately 1000 guests attended.

Honorary chairman of the event was Hughes' Chairman of the Board Allen E. Puckett, who, in his remarks, described "the essential characteristic" of the Flying Boat as "a product of a searching, innovative mind that wouldn't take no for an answer, a mind that often was a step ahead of its time."

"There's no way to overstate the importance of his achievements in science and technology," said Dr. Puckett of Howard Hughes, "and the extraordinary future he bequeathed to us in electronics and associated fields."

For his contributions and service to the AIAA, a plaque was presented to Dr. Puckett by Sidney Liddle, chairman of the organization's Los Angeles Section.

The Flying Boat, referred to as the "Spruce Goose," was constructed in sections at Hughes Aircraft's Culver City plant in the mid-1940s. Moved to a specially constructed dock in Long Beach Harbor in 1946, the sections were assembled and the Flying Boat made its only flight Nov. 2, 1947, with Howard Hughes at the controls.

The flight lasted approximately one minute and covered about a mile before Mr. Hughes settled the aircraft back into the harbor and taxied it to the dock. It remained there until 1982, when it was moved to the site of the new exhibit.

Hughes employees may purchase discount admission tickets at three Hughes Employees Association offices.

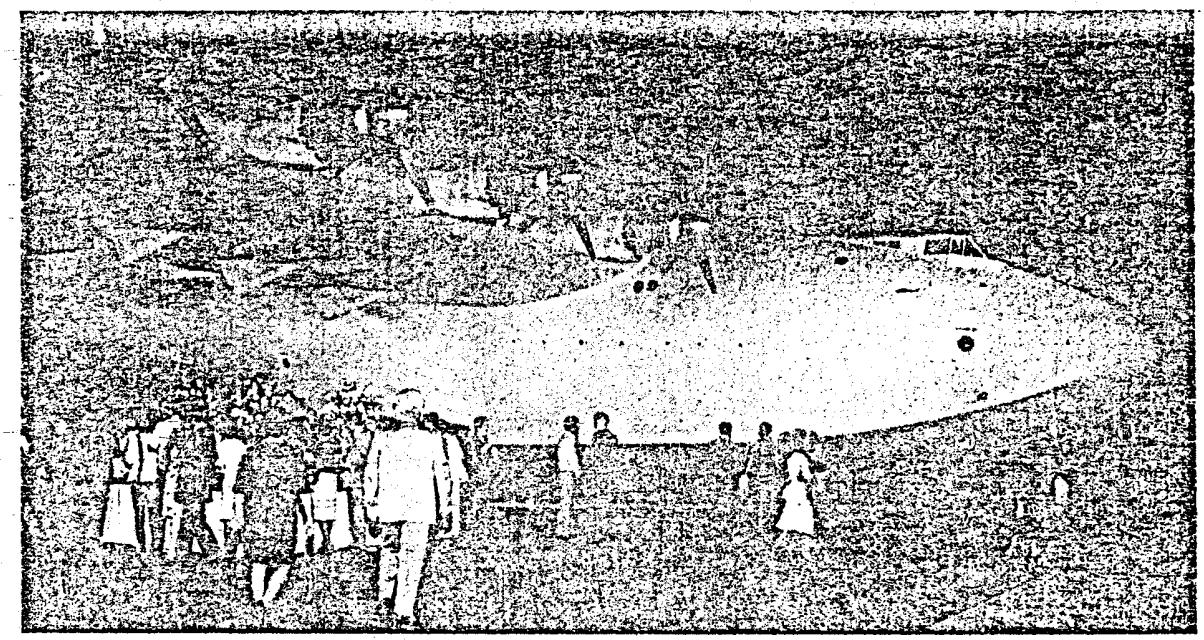
The El Segundo and Fullerton HEA offices offer combination tickets for admission to the Flying Boat and the Queen Mary, or admission tickets to the Flying Boat only. The Electro-Optical association offers combination tickets only.

Prices are: combination tickets regularly $8 are $6.50 at HESEA and HEOEA, $7 at HFEA; Flying Boat-only tickets regularly sold for $6 are $4.50 at HESEA and $5 at HFEA.

HESEA and HEOEA offices offer children's combination tickets regularly priced at $6.50 for $4.

Tickets to the Flying Boat exhibit are on sale to the public at the Long Beach location from 10 a.m. to 4 p.m. seven days a week. The exhibit is open until 6 p.m.

HUGHESNEWS
May 20, 1983



HUGHES FLYING BOAT is star attraction during reception at new home in Long Beach. (Vonack)

Thrusters for Space Nuclear Reactors

In December the Defense Advanced Research Projects Agency requested bids on a 100-kW space nuclear reactor for a reconnaissance satellite, perhaps carrying sea-scanning radar. If the reactor were devoted to producing thrust, only the magnetoplasmadynamic thruster could handle such power, Eugene V. Pawlik of the Jet Propulsion Lab and Robert J. Vondra of the Air Force Rocket Propulsion Lab told the AIAA/JSASS/DGLR 16th International Electric Propulsion Conference. In fact, NASA and the Air Force are working toward developing systems able to operate at powers of several megawatts. Systems of lower power might be used for outer planet exploration, making up drag of a large Earth satellite, attitude control, stationkeeping, and satellite orbital maneuvering. A 1-MWe system might transfer cargo between Earth orbits.

Compared to the ion thruster, the MPD thruster promises to have higher thrust density, which means fewer would have to be used, and to be simpler and therefore cheaper. The MPD thruster can be run continuously for high power or pulsed for low average power.

Development aims at attaining exhaust velocities of 15-100 km/sec at thrust efficiencies approaching 60%, system weights on the order of 1 kg/kW, and system lifetimes of at least 1,000 steady-state hours.

The thruster under investigation, called the self-field MPD thruster, has a central cathode and surrounding cylindrical anode. Experimenters at Princeton Univ. have measured thrust for a benchmark thruster with argon propellant and calculated specific impulse and efficiencies for extended and flared extended shapes.

The Rocket Propulsion Lab will test thrusters having lengths of 1-30 cm and inside anode diameters of 4-17 cm. The thrusters will use hydrogen, helium, nitrogen, neon, argon, krypton, and xenon propellants.

A 100-kW DOD/NASA thruster design uses heat pipes to cool the 5,000-J tantalum-cased tantalum capacitors. To absorb 100 kW average power in 4 ms pulses the system must produce a peak power of 4 MWe and store 20 kJ of energy.

In 13 years of work at Princeton efficiencies of its thrusters have climbed from less than 10% to about 40% at 2200 sec I_{sp} using nitrogen.

Astronautics and Aeronautics, May 1983

Stage: The Karamazovs, Juggling and Jokes Mix

By FRANK RICH

THE Flying Karamazov Brothers, while neither Russian nor brothers, are certainly the best jugglers anyone would ever want to see. In their boisterous, good-natured vaudeville act at the newly rejuvenated Ritz Theater, they juggle everything from flaming torches to eggs to razor-sharp sickles. Such feats are not idle monkey business. As one of the fellows explains, "There's only one end of a sickle one can catch — more than once."

The Flying Karamazovs have a few other tricks as well. When they're not juggling — and even when they are — they play musical instruments, sing a cappella, float deliberately outrageous puns and crack jokes. Some of these sideshows are amusing — none of them are douriy Dostoyevskyan — but they rarely distract from the main event. It's when the Karamazovs magically make juggling look like a dance routine or sound like a jazz jam session that their act really flies. It's when they invite audience volunteers to provide them with "juggling objects" — a slippery dead fish and a plate of jello at the preview I intended — that we're most involved.

The reason why this two-hour show can be found on Broadway rather than at the circus apparently has to do with the Karamazovs' somewhat romanticized conception of their nonjuggling talents. The jokes are studded with theatrical references — from "Gypsy" to "Rosencrantz and Guildenstern Are Dead" to "Hamlet" — and, when the men put on Groucho glasses, we see that they fashion themselves as new-fangled Marx Brothers. There are also mock musings on esthetics: they announce a list of "seven theatrical principles," among them the rather defensive statement that "there's more to the theater than repetition — but not much." Such talk, these days, certifies its purveyors as bona fide Performance Artists.

Because all five "brothers" are skilled at deadpan takes and comic timing, they may yet realize their ambition to clown as artfully as they juggle. At this point, their humor is knowing and erudite without being especially clever. Much of it is wholly reflective of the performers' origins — the West Coast — and recalls the late 1960's, pre-Hollywood antics of Cheech and Chong. What might, even now, convulse stoned audiences in Santa Cruz seems more precious than zany to this sober New York theatergoer.

•

It also remains to be seen if the Karamazovs can develop distinct characterizations à la the Marx Brothers or any other comedy team. With their black mock-Slavic uniforms, mangy whiskers and unruly hairstyles, they too often blur together: it's not for nothing that their costume accessories must come in different colors to help us tell who's who. Although all five are charming and equally accomplished at the act's various hijinks, it's only Randy Nelson, doing a beatific California blond routine ("Peace! Granola!"), who seems to march to his own, individually idiosyncratic beat. The others have hip attitudes in lieu of full personalities.

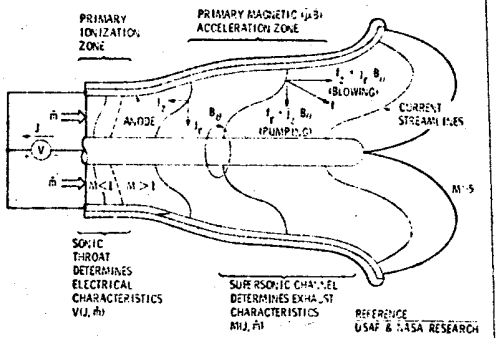
None of these failings, however, mar the sweet, rambunctious spirit of the evening or the many daredevil variations the Karamazovs work on their principal stock-in-trade. This show will please most children and any adults who don't mind too much of a good, if limited, thing.

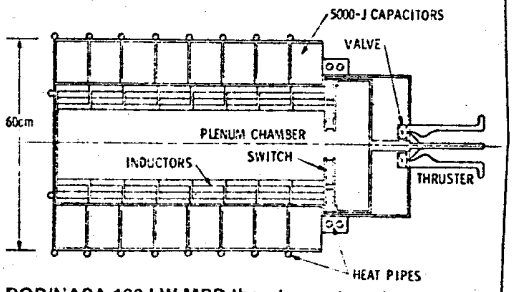
Objects Aloft

THE FLYING KARAMOZOV BROTHERS. Setting and costumes, Robert Fletcher; lighting, Marc B. Weiss; associate producers, Harold Thau and Robert Courson. Presented by Marce Neufeld and Viacom International Inc. At the Ritz Theater, 219 West 48th Street.

Dmitri ..... Paul David Magid
Alyosha ..... Randy Nelson
Fyodor ..... Timothy Daniel Furst
Smerdyakov ..... Sam Williams
Ivan ..... Howard Jay Patterson

SELF FIELD MPD THRUSTER



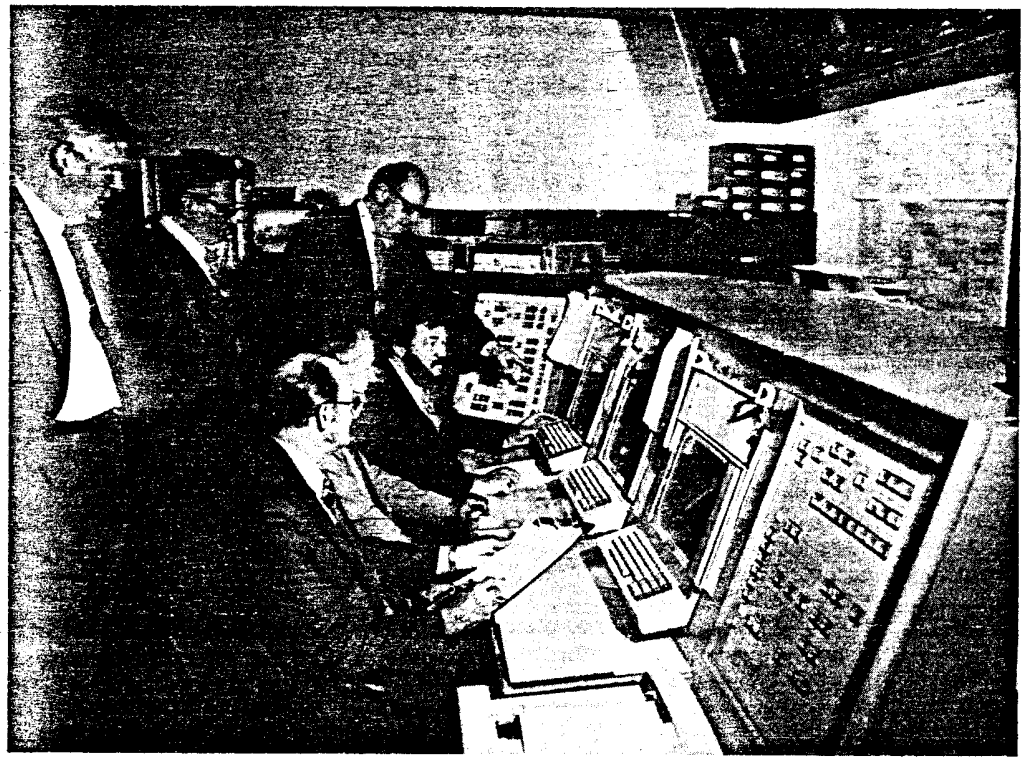


DOD/NASA 100-kW MPD thruster system design would have a mass of 750 kg.

Typical house organ — didn't even MENTION who killed it for them...

Pioneer Satellite in New Orbit

Company Retires Westar I



SERVICE ENDS—Members of the original Westar I launch team and others responsible for operation of the satellite over the years gather at the Glenwood satellite control facility to start the decommissioning process for the pioneer satellite. Sitting at the controls are, *from left,* Jim Judson, Skip Minger and Ted Hessler. Standing are Bill Callanan, Bob Garbarini and Jack Van Cleve.

Westar I, Western Union's history-making satellite, has been retired from service. Launched in 1974, Westar I was the nation's first domestic communications satellite and established the Company's position as a leader in satellite communications.

The first of Western Union's fleet of five communications satellites, Westar I was launched into space on April 13, 1974, from Cape Canaveral, Florida, by a NASA Thor-Delta rocket.

Three months later, former Western Union Chairman Russell W. McFall tapped out "What hath God wrought!" on a telegraph key, and the first message sent via the new satellite traveled 47,000 miles from New York to the satellite and then to Los Angeles.

Like most communications satellites, Westar I was in geostationary orbit in an assigned position 22,300 miles above the equator, revolving with the earth rather than orbiting around it. The satellite relayed data, voice, video and facsimile communications traffic for nearly two years longer than its estimated life.

At an informal "retirement party" on April 18 at Western Union's satellite command station at Glenwood, New Jersey, some of the major contributors to the development and operation of the satellite took part in the decommissioning process.

On hand for the slow movement of the satellite out of geosynchronous orbit were Bob Garbarini, Jack Van Cleve and Skip Minger, original members of the launch team. Also on hand were Bill Webster, Jim Judson, Bill Callanan, Charles Miller and Ted Hessler, key personnel in the operation of Westar I.

Others on the original Westar team were Bill Ziegler,

(Continued on next page)

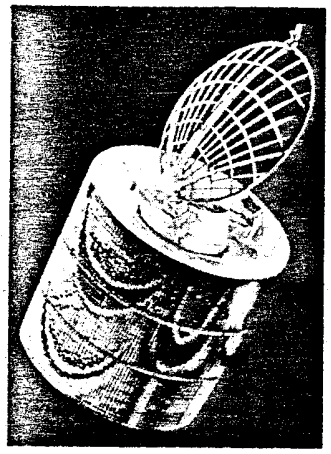
Who ARE these guys?!

(Continued from front page) who was program manager, and Bob Greenquist, who was in charge of engineering preparations.

"We gave our pioneer satellite a well-deserved salute when we released more than 3,000 pulses of the jet fuel remaining on board to start repositioning Westar I," explained Ted Hessler, Senior Director – Spacecraft Operations at Glenwood.

Now positioned approximately 40 miles farther from earth, Westar I has begun an eternal orbit that does not conflict with the positions of active geostationary communications satellites. During the next few months, the Glenwood satellite control facility will coordinate telemetry command and ranging functions with the North American Air Defense Command and with other satellite operators. Just before Glenwood's LOS (loss of signal), the final command will be sent to turn off the telemetry beacons, signifying the true end of Westar I's operational life.

According to Mr. Greenquist, who has been with the satellite program since 1965, the Company had a mandate to be the first in the United States to put up a communications satellite.



IN RETIREMENT—Westar I, *above,* America's pioneer communications satellite, has been retired from service. Westar II and Westar III, identical satellites, are still in operation.

"And that mandate was fulfilled," he said. "Westar I was followed by Westar II in October 1974, but it was 18 months before another company – RCA – joined us in space," he said.

Mr. Van Cleve, who has had a key role in the launch activities for all of the Westar satellites, noted that Westar I was the trail blazer in the first generation of domestic communications satellites.

"It lived up to all our expectations and more," he said. "If Westar I had not been as good as it was, our industry might not be where it is today."

Mr. Garbarini, who started working on Western Union's satellite program in 1967, said that few people expected satellites would come along so soon.

"In 1966, Western Union filed for authorization to construct an earth-station network to serve future satellites," he recalled. "But the Federal Communications Commission turned us down. They said our application was premature!"

But Western Union continued its work and in 1970, after the FCC adopted an "open skys" policy, it was the first company to submit an application to construct a domestic communications satellite.

"This time, the FCC accepted our application for filing without question," Mr. Garbarini said, "and our satellite program was under way."

from Western Union News, May 1983

Typical house organ - they could have talked to O.D. instead of Management. Westar-I is now 67 miles higher than it used to be.

By the numbers: Italspazio, the Italian consortium whose formation was announced by the *Journal* in March, has issued a study of space communications markets which predicts that nearly 200 spacecom satellites will be built within the next 20 years. Here's the Italspazio crystal ball breakdown, by use:

	New sats by 2003
INTELSAT	24
Domsats	80
Maritime, aeronautical	10
Direct broadcast	30
Videoconfsats	30
Metsats, navsats	20
Total	194

from Hughes SCG Journal, May 1983

Aviation Week & Space Technology, April 18, 1983

NASA Forecasts Satcom Capacity Saturation

Demand for satellite communications service in the U.S. will saturate available geosynchronous arc and frequency spectrum capacity in the early to mid-1990s, even if orbital spacing is reduced to 2 deg. in both C- and K_u-band, according to a National Aeronautics and Space Administration forecast.

Western Union Telegraph Co. and the International Telephone & Telegraph Corp. have completed the study under contract to NASA's Lewis Research Center to update a similar forecast in 1979 (AW&ST Feb. 25, 1980, p. 42).

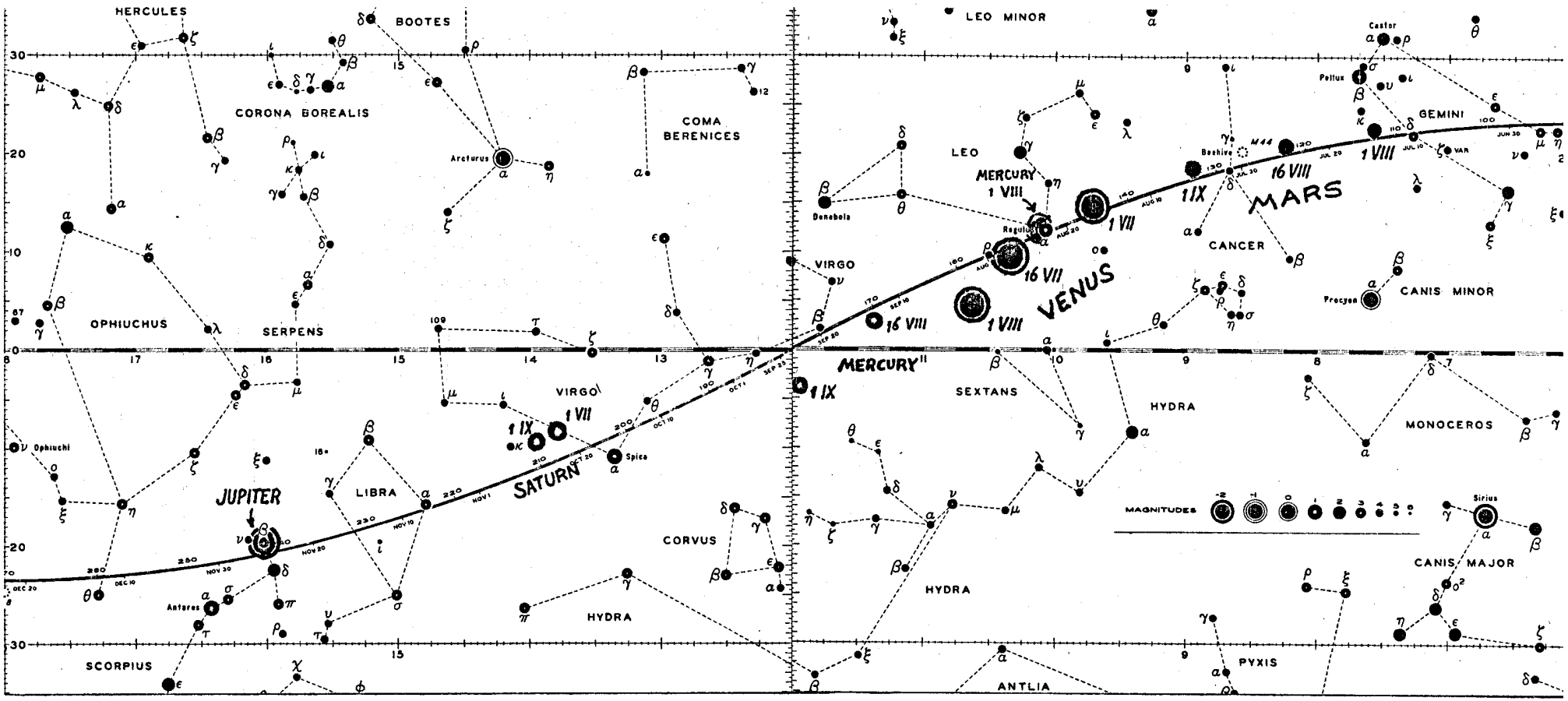
The forecast is based on the premise that spacing will be 2 deg. for both C- and K_u-band with extensive use of single sideband transmission, Steven Stevenson, market assessment technical manager in the center's Space Communications Div., said. Satellites now in orbit or proposed exceed C-band capacity with existing 4-deg. spacing and nearly equal K_u capacity at 3-deg. spacing in use for that band (AW&ST Mar. 14, p. 105). The forecast shows 1,460 equivalent 30-MHz. transponders available in orbit by the year 2000 and 1,280 in 1990 compared with 680 in 1980.

By estimating total U.S. telecommunications demand and then apportioning that demand among 313 metropolitan areas, Western Union predicted the amount of trunk traffic likely to be carried by satellites using regional Earth stations and terrestrial local-area distribution.

Potential satellite trunking demand will be as high as 2,790 equivalent 30-MHz. transponders by the year 2000 and 1,200 in 1990 compared with available demand in 1980 of 260 transponders, according to the study.

Western Union also conducted a survey of users to predict customer-premise Earth station usage and predicted a demand of 738 equivalent transponders for the digital service in the year 2000 and 269 in 1990, compared with 23 in 1980.

NASA calculated a second set of trunking and customer-premise demand forecasts from peak-hour customer-premise data rate predictions supplied by ITT. This process produced trunking demand for the year 2000 of 2,704 equivalent transponders and customer-premise demand in that year of 694.



THE PLANETS -- 1 JULY TO 1 SEPTEMBER

Mercury will be very close to the Sun during this interval and thus will be very difficult to see at all; it passes $0^{\circ}.4$ north of Regulus on August 1st. Venus attains its maximum brilliancy on July 19th; it passes $0^{\circ}.7$ south of Regulus on July 9th. It will drop very rapidly in the west with successive sunsets and will not be visible by early August. Mars emerges as a morning star in August and will quickly pull away from the Sun; by September, it will be fairly high in the east at sunrise. Jupiter continues to be the brightest object in the late night sky (after the Moon), visible low in the south and setting five to four hours after the Sun. Saturn is of modest brightness and can be found in the southwest, setting 4 to $2\frac{1}{2}$ hours after sunset.

The Earth reaches its aphelion on July 6th at about 6 AM EDT, when it will be 152,103,000 km. (94,512,000 mi.) away from the Sun.

Sized to Fit

INTERNATIONAL SATELLITE MARKET DEBATED AT PARIS SALON; LAUNCH COSTS, FIBER CABLE COMPETITION, SIZED UP FOR REST OF DECADE

PARIS — "We will never build a bigger satellite than Intelsat VI," Hughes Space & Communications Pres. Albert Wheelon told reporters at Paris air show soiree. Assertion served as major point in controversy turning around shape, size & specifications of satellite of future. These questions drew debate even within companies represented at international air & space salon. Following is discussion of launch vehicles, upper stages, configurations of satellites serving late 1980's-early 1990's from perspective of those who will design & market them:

Wheelon's much discussed theory of future satellite systems involves cluster concept whereby 6-12 satellites could be grouped together in one orbital location, each with package of spot beams and each with capacity of being repaired in orbit or replaced when spent. Hughes has patent on concept and Wheelon has reputation of being its best salesman — many in international group of satellite makers heard from him at some point in 2-week meeting. Upshot of argument for smaller, clustered satellites versus larger modular units which could have parts removed & replaced in orbit is that: "It's easier to replace one whole satellite, and it's more likely that parts for variety of purposes will wear out at different rates [making modular repair costly and cumbersome]," Wheelon said.

'Midsized' Model May Dominate

Hughes's "midsized" entry will be HS 393, 4,000 lbs. in transfer orbit, twice capacity of HS 376, with 1-1/2 kw of power. RCA Astro was talking publicly for first time about plans for its Series 5000, which would follow logically on Ku-band bird, be prospective candidate for Intelsat VII. Satellite would be in 5,000-7,000 lb. range, and prospectively even as heavy as 10,000 lbs., according to Ed Walthall, mgr., technical division. Bird originally was to be in design stage along with RCA's Ku-band satellite, but was deferred until late-1980's; design specifics are still in planning stage, Walthall said. DBS and Ku-band services, or C- & Ku-band hybrids, will be possibility, according to U.S. manufacturers, but none endorsed European experimental concept of massive, multipurpose bird as operationally workable.

Europe's "midsized" birds, and even its larger DBS entries, are small in comparison with British Aerospace's Olympus (formerly L-Sat) which will weigh in at 5,280 lbs. at launch, 3,200 lbs. in orbit. European Space Agency, which encouraged development of Olympus, and its makers argue that multi-purpose big bird will serve Europe when govts. come to terms with reality that economies of scale and orbital arc space will make leasing on one large satellite economically mandatory, if politically unpopular. Peter Hickman, managing dir. of BAe Space & Communications Div., foresees market for more than 150 Olympus-class craft before year 2000. As for use, ESA argues in favor of "larger and more diverse space segments" in next decade because "second generation systems for mobile and European fixed services will be required."

Eurosatellite's Rolf Arnim criticized Olympus for high development cost, said he's "not a believer in multi-mission" satellites because most European countries which will need satellite services won't be able to afford "all the extras... The challenge to satellite makers is to come up with a satellite that's within reach of a country like Switzerland, where the yes-no cost of initial investment has to be dealt with before you deal-with economies of scale."

Need in future for continent will lie mostly in video services anyway, Arnim said; given growth of fiber optics, "the [number of] telecommunications satellites will stagnate or decrease." Reason for continuing need for satellites is their ability to relay mass amounts of information to many places at once; land links may take over from there to handle home shopping or other viewer response data, he said. Eurosatellite will be first on pad with operational DBS system, TV-SAT/TDF-1 for Germany & France. Actual 2-satellite system — each with 3 channels — is designed for launch on Ariane 2 in 1984, has launch mass of 4,400 lbs, 7-year life, 3 kw.

As prototype, which Arnim somewhat wistfully said would be better suited to U.S. market than DBS bird RCA is building for Satellite TV Corp., bird lists under firm's "heavy satellite" category, has launch mass of 4,400-5,500 lbs., 3-6 kw, could carry twice as many channels. Market opportunities are Spain, Sweden, Saudi Arabia, Argentina, Brasil, China, firm's literature suggested. Arnim said 2 types of countries ready for DBS are those where: (1) 2nd or 3rd TV channels would be very costly because no land lines are available — lengthy country such as Norway, for example. (2) There isn't frequency room available for channel expansion, e.g., Germany.

Eurosatellite's version of "medium class" satellite is 2,200-4,000 lbs., 1-2 kw, 3-axis, modular bird designed for 1/2 Ariane or shuttle. Australia, African & Arabian countries and Colombia are target markets. Appearance of future satellite will be "flatter, more stable, like a tuna can," Arnim said; 5 years from now, Europe may launch 2-3 satellites yearly. Aerospatiale's assessment of market, as expressed by Francois Turck, sales & marketing mgr. in Space Div., is that out of projected 200 satellites to be ordered world-wide over next 10 years, 2/3 will be in medium range.

It should be said that neither Germany nor France has placed firm order for 2nd TDF-type satellite; estimated cost of $60 million coupled with political and economic uncertainty may be cause for feet-dragging.

One interesting advance exhibited at salon, which promises to keep weight and thus launch costs down, was MBB/Erno's Ultra Lightweight Solar Panel (ULP) which yields around 40-50 watts per kg (compared with 27-28 watts per kg on Intelsat 5 satellite). Panel combines flexible carbon fiber blanket with stiff frame, also made of carbon fiber — technology developed from company's advances in helicopter blades. Design is being marketed to builders of new generation of high-power DBS.

Launch Systems

Building for shuttle or larger variety of Ariane 4's will push satellite weight up, according to both NASA and Arianespace spokesmen. Size increase for shuttle means room for new generation of upper stages, motors which propel satellites into geosynchronous orbit. Hughes is touting concept of "integrated propulsion" system which it will attach to Intelsat VI. Wheelon said "built-in" system wouldn't add more than few million dollars to satellite cost, significantly less than Air Force IUS which Wheelon has lambasted as running $100 million over cost projected for mid-1980's. He cites launch cost differential between I6 with integral propulsion and NASA's TDRS with use of IUS as around $89 million, though birds are roughly same size.

Others take Hughes to task for "creative bookkeeping," saying that cost of integral propulsion system was only integrated with cost of spacecraft. Motor makers lament trend toward satellite makers going into propulsion business, understandably asserted that specialized propulsion manufacture would give satellite customers opportunity to shop around for most economical system tailored to need. On flip side, because upper stage development for new, larger birds is running behind plans for stages, satellite manufacturers like RCA Astro are conducting in-house studies for developing own mix-&-match motor shop.

NASA is doing its part to add to its stable of upper stages, put arm around Orbital Systems Corp. at special press briefing May 31. OSC has memorandum of understanding with space agency and preliminary agreement with Martin Marietta to develop and produce vehicle. Newest in field of launch entrepreneurs, OSC's Scott Webster told us Transfer Orbit Stage (TOS) would "fill the gap in space shuttle payload delivery capability between the PAM upper stages developed by McDonnell Douglas and the Centaur upper stage being developed by NASA and the Air Force." NASA saw enough need for stage that "they would have built it themselves if we hadn't wanted to finance it," Webster said. OSC gets exclusive marketing rights; MM will be prime contractor and systems integrator; United Technologies will supply solid rocket motor which powers stage.

Vehicle design is based on solid-propellant first stage motor used in IUS, but, because of "relatively low projected cost to develop and produce the vehicle," TOS will offer users "approximately four times the payload weight capacity of the most popular current upper stage at only twice the price," Webster said. Company quotes NASA reports and other market surveys as projecting 20% annual growth in number of new on-orbit communications satellites as well as "substantial replacement rates for present satellites though the early 1990's." Stage is optimumly effective and priced for 7,000-lb. bird (weight in transfer orbit), fact which Webster said made "Intelsat's eyes light up" when stage was presented as possible assist vehicle for Intelsat VII.

(continued on next page)

excerpted from

SATELLITE WEEK— JUNE 6, 1983

OSC forecasts 34 missions for TOS vehicle from 1986 through 1992, including commercial communications, NASA, DoD, international scientific & communications satellites. Company's chart, following, projects launch costs for comparable systems:

System	Capacity (lbs.)	Cost*	ILC**
Shuttle/PAM-D	1,200	18.0	1982
Ariane 1	2,100	16.0	1982
Shuttle/PAM-A	2,200	18.0	1983
Atlas G/Centaur	2,700	24.0	1984
Shuttle/IUS	5,000	25.0	1983
Ariane 4	6,800	12.0	1986
Shuttle/Centaur	12,000	14.0	1986

*Thousands of dollars per lb. **Initial launch capability (year).

Alternative to shuttle with stages, as mentioned above, is Ariane 4. There are actually 6 versions of vehicle designed for use in 1986, with launch capacity ranging 4,400-9,260 lbs. New system, SPELDA (Structure Porteuse Externe pour Lancement Double Ariane), will provide dual launch capability, will increase fairing to 4-m diameter. Rocket will have first stage "considerably lengthened" from Arianes 2 & 3; Ariane 3 will be able to place about 5,700 lbs. or roughly 2 PAM-D class satellites, in transfer orbit, with dual launch system Ariane/Sylda transporting them to geo. Cost for dual launch by Ariane 3 will be $25-$30 million per satellite. ESA's ECS-2, Marecs B-2, Telecom 1A & B, Arab League's satellite Arabsat-1, and Southern Pacific's Spacenet-1 & -2 are scheduled for Ariane 3 launches. Company estimated worth of contracts at around $26.6 billion, of which 50% is for export outside Europe. Annual launch business, thanks to NASA's overestimation of its capacity with 4-orbiter fleet, should be around $18.5 billion in 1985, company said.

Company's optimism should be tempered by recognition of its need to show performance in coming Ariane launches. Failure of Ariane L5 and delays in L6 launch may be reason why Westar 6 & GStar A, previously manifested exclusively on Ariane, have been scheduled to fly on STS-11 & -15 respectively. It was reported that Telesat Canada also may cancel its Ariane reservation for Anik D, if shuttle launch of Anik C-2 on STS-7 is success.

For future, Arianespace intends for Ariane "family" to grow through 1990's to capacity of little over 15 tons, aimed at use in transporting space stations, multiple satellites, etc., according to company materials. Much larger cryogenic stage will be developed, and Ariane 5 concept may be unmanned, reusable vehicle.

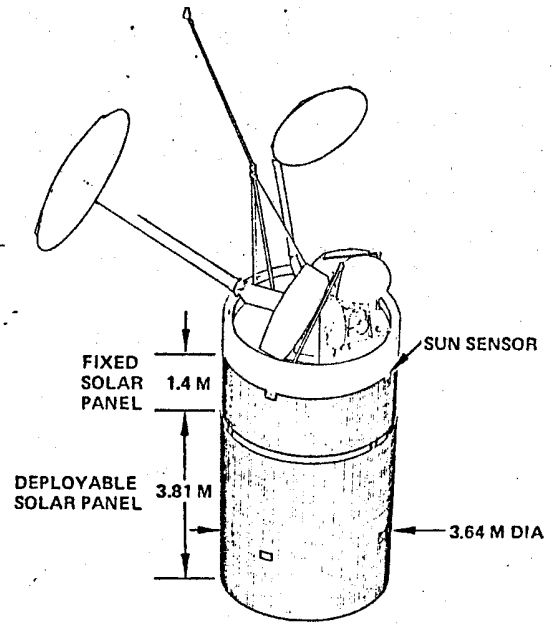
NASA kept high profile throughout salon whenever issue of competition between U.S. shuttle and French expendable system arose; Lt. Gen. James Abrahamson, shuttle program dir., even showed up at Arianespace news conference May 30, was described by European onlookers as "charming." Popular Rockwell computer in U.S. pavilion also proved marketing tool; to simple commands, it tendered hard-copy printout to onlookers showing cost of payload to fly shuttle at given times, showed earliest available date to given spacecraft specifications, provided details on payment schedule. (For prospective customers, earliest spot is for TDRS-sized craft on STS-11 in Jan. 1984, along with Westar 6 and Palapa B2.)

Overall, space sector is growing rapidly, taking into account 200-300 commercial satellite launches anticipated from now through end of century. Most projections put Ariane figures on high side of even optimistic trends, place overall commercial space activities ticket through next 17 years at somewhere around $20-$30 billion.

ADVANCED WIDEBODY BUS CONCEPT RAISES SPINNER TO MULTI-kW CLASS AND STARTS NEXT 20 YEARS OF GROWTH

HUGHES

- 5 UNDER CONSTRUCTION
- 1ST LAUNCH – 1986
- INTELSAT VI EXAMPLE SHOWN
  - 2 kW
  - 0.1° POINTING WITH SMART SUN SENSOR SYSTEM
  - 0.03° POINTING POSSIBLE WITH BEACON TRACKING



HS 376
- PAYLOADS: 300 LB, 500 TO 700W
- 10 YR
- 1/6 STS CARGO
- DELTA
- ARIANE-SHARED

HS 393
- PAYLOADS: 500 TO 800 LB, 1 TO 2 kW
- 10 YR
- 1/4 STS CARGO
- ARIANE 4-SHARED

INTELSAT VI
- PAYLOADS: 1,500 TO 2,000 LB, 1.5 TO 2.3 kW
- 10 YR
- 1/2 STS CARGO
- ARIANE 4

THREE PERIGEE STAGES AVAILABLE

CURRENT GENERATION

1/6 STS OCCUPANCY
COMM. PAYLOAD 300 LB, 700 W

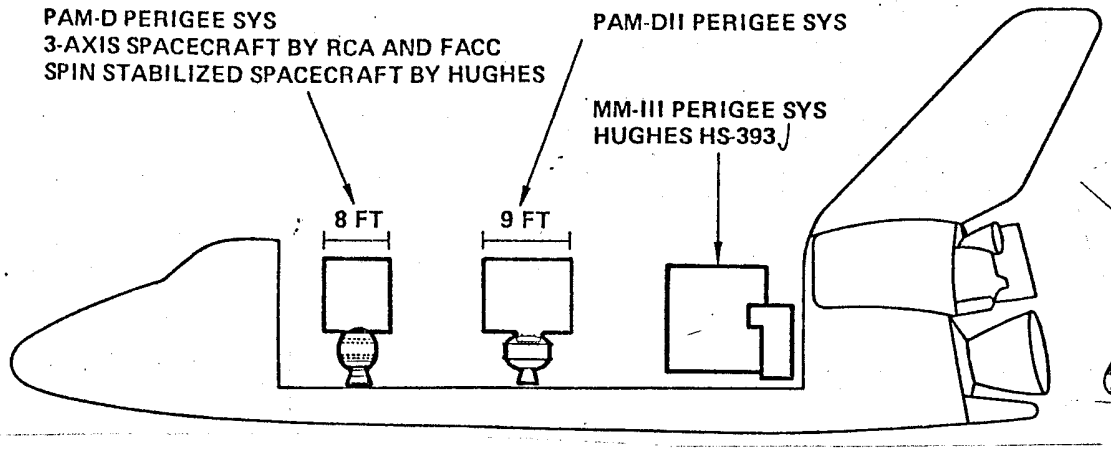
PAM-D PERIGEE SYS
3-AXIS SPACECRAFT BY RCA AND FACC
SPIN STABILIZED SPACECRAFT BY HUGHES

NEXT GENERATION

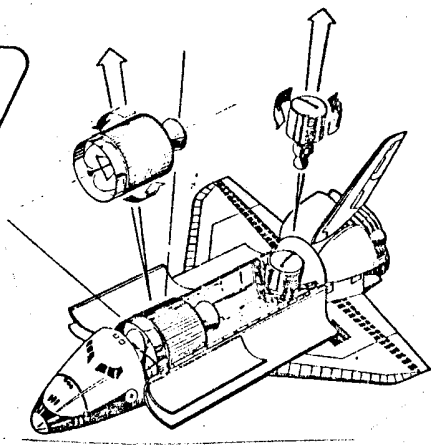
1/4 STS OCCUPANCY
COMM. PAYLOAD 600 LB, 1400 W

PAM-DII PERIGEE SYS

MM-III PERIGEE SYS
HUGHES HS-393



SEPARATION FROM STS



ROLLOUT OR FRISBEE TECHNIQUE

- ROTATION PLUS TRANSLATION

PYRO RELEASE OF 5 CARGO ATTACH LUGS AND 1 EJECTION SPRING

SAME SIMPLE SYSTEM AS ON LEASAT AND INTELSAT VI

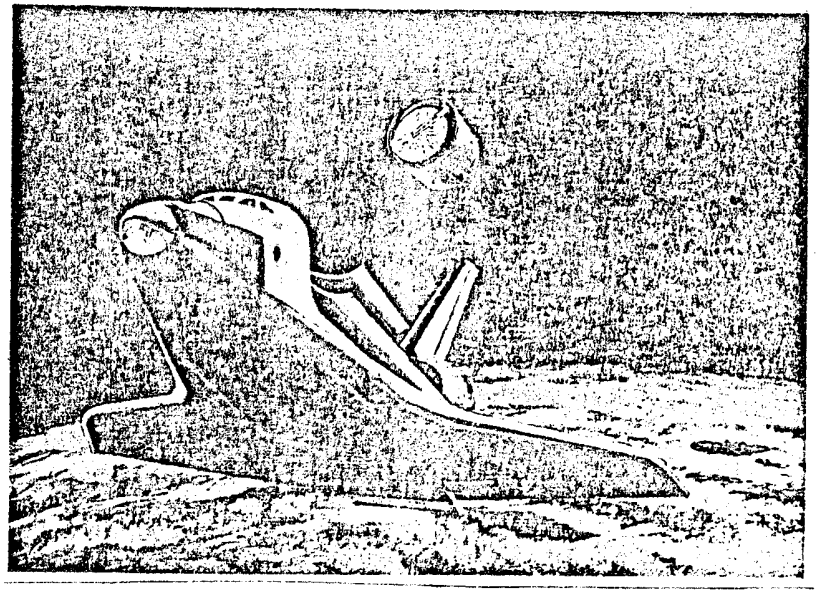
HS 393 MISSION WEIGHT SEQUENCE

MINUTEMAN III PKM + 2'' (40:1)

MISSION EVENT	WEIGHT (LB)
STS PAYLOAD	15,913
CRADLE	2,731
STS SEPARATION	13,182
PKM EXPENDABLES	7,645
PKM CASE, CARRIER, AND ADAPTOR	715
SPACECRAFT IN TRANSFER ORBIT	4,822
APOGEE BOOST AND STATION ACQUISITION	2,175
BOL ON STATION	2,647
STATIONKEEPING (10 YEARS)	445
STATION CHANGE	9
EOL WEIGHT ALLOWABLE	2,193

HS 393

SPINUP AFTER EJECTION



Inquiry Cites Control System in IUS Anomaly

Los Angeles—Cause of the USAF/Boeing inertial upper stage (IUS) anomaly that resulted in the Tracking and Data Relay Satellite (TDRS-A) being placed in the wrong orbit apparently was the result of a single, mechanical-type of failure in the control system of the upper stage, officials said last week.

The Joint Anomaly Evaluation Board, which has been studying the incident since Apr. 7, determined the problem was not the result of a series of failures. Although other anomalies did occur during the IUS mission, they did not appear related to the specific problem that placed the TDRS-A satellite in an elliptic rather than geosynchronous orbit.

Investigators were continuing last week to determine why the failure occurred. They expected to complete a recommendation this week on how the problem would be corrected on subsequent inertial upper stage flights. Board members also planned to start compiling a final report on the incident; the report is expected to be completed in early June.

Meanwhile, the perigee of TDRS-A on May 25 had been raised by about 6,000 mi. to an altitude of 18,545 mi. following more than three weeks of tests and orbital maneuvering aimed at raising the orbit. The satellite was placed in an orbit with a 12,600-mi. perigee and a 22,000-mi. apogee by the inertial upper stage. Program officials remained confident last week they could raise the TDRS-A orbit to a geosynchronous altitude of 22,300 mi.

Officials were transitioning the satellite from a Sun-pointing mode during orbital maneuvers to control of attitude through the satellite's inertial system to increase efficiency during thruster burn periods. The inertial mode was used for the first time during an orbital maneuver on May 24. The satellite then was returned to Sun-pointing mode.

Officials from TRW, which built the satellite, also were working on a plan that would enable them to better predict thruster burn times so that the guidance plan for placing the satellite in its final operational orbit could be established.

The guidance scheme to reach final orbit could include scheduling appropriate contingency time periods, which could be used as rest periods for the satellite control crews.

Consumption of the attitude control system hydrazine propellant remained nominal, with 541 lb. of propellant having been consumed as of May 25. Program officials said 777 lb. of propellant remained on the satellite to complete orbital maneuvering and support the spacecraft on orbit during its 10-year design life.

Aviation Week & Space Technology, May 30, 1983

Seiko Watch Listens, Talks Back

NEW YORK — Just one year after it demonstrated a television wristwatch, Seiko Time Corp. has announced that it will soon market a timepiece that will listen and talk back to its wearer.

The watch, which will be marketed before the holiday season for less than $200, has an integral 8-second voice recorder, uses a CMOS voice digitizer, CMOS memory (for 8 seconds of contiguous speech) and a D/A reformatter chip, all believed to be Suwa Seikosha proprietary components.

Last month, researchers at a Swiss research lab, Asulab, AG, showed a voice-recognition watch with a 15-word vocabulary. After a learning session with the owner, the speech comparison circuitry gives the wearer enough control over the watch to dictate the time for setting, alarm, etc. The technology was merely demonstrated—the group has not announced a product or price range yet.

For those of you who still think digital watches are a pretty neat idea →

(E.E. Times, June 13 (?), 1983)

Shuttle 8 May Carry Postal Cover Payload

Washington—Shuttle Mission 8, planned for launch in mid-August, is expected to carry a payload of about 250,000 commemorative postal covers that the U. S. Postal Service and National Aeronautics and Space Administration would sell to collectors following the orbital flight. The covers would commemorate NASA's 25th anniversary.

Details of the project remain under negotiation, but a charge of $15 each has been discussed. A $15 charge would bring in $3.7 million that would be split between NASA and the Postal Service.

The Postal Service earlier had asked the space agency to consider as many as 500,000 covers. The 250,000 covers would weigh more than a ton, excluding their support canisters.

Space became available for launch of the covers on Mission 8 when NASA had to remove the Boeing Inertial Upper Stage/TRW relay satellite payload from the flight because of the IUS problems encountered on Mission 6.

When that heavy payload was dropped, it opened space in the bay, allowing NASA to plan to put in eight Getaway Special canisters containing covers.

In addition to the canisters, two boxes full of covers are planned for placement on the support structure used earlier to carry development flight instrumentation hardware, according to officials.

Mission 8 also will carry the Insat 1B spacecraft and the payload deployment and retrieval flight test article.

The test article was originally planned to fly on Mission 11 but moved to Mission 8 after the IUS was dropped. It will be used to provide manipulator arm exercises with a heavy payload simulating different centers of gravity.

The Insat 1B satellite is a combined weather/meteorological spacecraft built by Ford Aerospace and funded by the Indian government.

AW&ST, June 13, 1983

POLES OF ORDER 1
APA-TECH 23

MEROMORPHIC MISH-MASH: Thinking it over later, I realized that Higgins missed a good bet at Capricon. Since his talk was connected with particle physics, he could have called it "The Bill and Baryon show"...

POLES OF ORDER 2

MY JOB: An omni-directional treadmill shouldn't be too hard to construct. A regular treadmill, with encoders for reading distance covered, could be mounted on a large platter with an encoder on the axle to read "azimuth". It would have to be strong enough to stand upon and one might need a rail around it to help one turn around. Such artifices would be a transitional step to the point of having the computer simply watch your body movements and interpret those for game responses.

The closest thing to an orrery [named for Charles Boyle (1676-1731), the fourth Earl of Orrery] that was devised through ancient mathematics was the "planetary computer" that was pulled out of the Aegean sea. From what I remember of it, it was a gear-work device which could display the positions of the then-known planets against the zodiacal constellations; the machine is believed to be about eighteen hundred years old (what's left of it). Of course, all the ancient civilizations had a good knowledge of the synodic periods (i.e., the intervals over which planetary positions relative to the Earth are repeated) of all the classical planets, but it doesn't appear that any of them built mechanical models. The beliefs of people like von Daniken notwithstanding, it is fairly easy to work out the motions of the naked-eye planets after a couple years of visual observations and then build a simple mechanical model. The timing could be improved as the span of observations increased. In the course of a few decades, one could start modifying the mechanism to allow for the non-uniformities of the planets' movements (due to orbital eccentricities). This would give you an orrery (built up from scratch) good enough to fit the observed planetary locations to at least one degree.

MEROMORPHIC MISH-MASH: It occurred to me later that it might not be obvious to everyone just how much energy a megajoule is. The most direct example might be to look at how much energy a human body uses. The average American consumes about 2400 Calories daily; these are the dietician's or large calories (the Pepsi people are WRONG: Diet Pepsi has one LARGE calorie). A Calorie contains 1000 small (or physicist's) calories and a calorie is about 4.2 joules. so the typical American goes through

$$2400 \text{ Calories} = 2.4 \cdot 10^6 \text{ calories} = 10.1 \text{ megajoules per day.}$$

(This gives you an average power rating of $10.1 \cdot 10^6$ joules / 86,400 seconds = 116 Watts.)

The cost of eating in America is roughly five dollars a day per person, so you are purchasing food energy at a rate of about two megajoules per dollar. This is about twenty times less than the rate at which you buy electricity. If you could plug yourself into the wall and recharge at 40 megajoules to the dollar, $5 would keep you going for about three weeks; you could live on about 25 cents a day. I've sometimes thought this would be a convenient arrangement: I'd be able to keep myself going without having to cook or clean up afterwards. I think I'd come to miss all the associated sensations of eating, though. On the other hand, do androids dream of electric lamb chops?

I found a Social Security chart since I wrote about our taxes. The Social Security tax began in 1936, so a lot of people who have been paying into it since then are just recently getting something back. (If you started work at 18 then, you would probably be retiring THIS year.)

GALLOPING GLITCH: Welcome at last to APA-TECH; I hope Los Alamos is treating you well.

You didn't want to be involved in any "Barsoom brawls"? I'd no idea there was much of a Martian population in Amarillo...

The April issue of Astronautics and Aeronautics had a fairly comprehensive article on tethered satellites. As usual, Tsiolkovskii thought of them first. There wasn't anything about pig roasting, though...

POLES OF ORDER 1
APA-TECH 24

TRANSPORTER #19: For an electronic system in space, I think the cold tends to work for you. One of my concerns about the von Neumann ships was that the atoms in the micro-circuitry would migrate over the millenia; in time, your computers would cease to behave as such. I spoke with Doc Consolmagno about this once -- he felt that operating at 3 K in interstellar space might prevent that. On the other hand, your machine is only 2 to 4 AU from the Sun and will be operating at an equilibrium temperature rather higher than that, say 100 K or so. That's one thing to think about, anyway.

Another problem is radiation, chiefly from the solar wind but also from the leakage of former solar particles out of the Jovian radiation belt. The latter would peak about every 4 to 24 (or more) years as the machine swung past Jupiter in a given orbit. The solar wind travels at around 1000 km/sec through the asteroid belt and its density is around 10 particles/cc (largely protons, electrons and alpha particles). The flux of particles would be about

$$1000\ ^{km}/_{sec} \cdot 10^5\ ^{cm}/_{km} \cdot 10/cm^3 = 10^9\ /cm^2/sec\ ;$$

over 1000 years, every square centimeter would be struck by

$$10^9/sec \cdot 3 \cdot 10^7\ ^{sec}/_{yr} \cdot 10^3\ yr = 3 \cdot 10^{19}\ particles.$$

That's a lot of potential damage sites. One might be able to shield the central processor (how well?) but I don't hold out a lot of hope for the sensors.

Reading the article about Lippmann made me think that still holography was at that stage 20 years ago and holocinematography is about there now. It gives one hope.

TRANSPORTER #20: I saw a bit on the Las Vegas Wind Tunnel on television. Does the voice on the headphones tell you to "prepare for Carousel"?

The notes on the B-36 were interesting. What was the period during which it was in use? Are there any still extant?

A COOLISH FANSISTENCY: After reading about all your new toys, I'm going to expect a tour of DEC next month...

INCOMPREHENSIBLE KNOWLEDGE: I've been to Detroit and Columbus; tell us more about what Austin is like. I'm presently leaning toward Detroit, but I could be persuaded to throw in my lot with you folks (as long as they don't make me wear that hat...).

ABANDONED, TIRE-WRECKING FREEWAY: If magazines are flowing across your desk, what are they printed on? Is this the origin of the expression "a high watermark in publishing"?

I just sent for a copy of the NASA workshop publication, Advanced Automation in Space. We'll see what it has to say...

The GT Joe package looks suspiciously like the one for "GT Joe in Glenwood," except with different squiggles on the oscilloscopes.

TGIF: Welcome to the APA. Considering the places where I've met you, it comes as a surprise to me that you are from Chicago.

My feeling is that any strategy for repopulation by humans is meaningless if it does not take personalities into account. That complicates the matter beyond facile analysis. That's as far as I think I can carry it. Your story is that of human history. Some people would probably kill each other, the original group would split into tribes, etc. (Ten thousand years later, they would have H-bombs and cheese-flavored dog food.)

I am also interested in aspects of climatology, particularly the human influence on climate (and vice versa) and the thermal history of the Earth's surface over geological time. The latter feeds back into my interest in the origination and evolution of life on Earth and its implications for extraterrestrial life. I've been accumulating papers on this gradually. Have you any suggestions?

WINDS OF CHANGE: That was a good eulogy to Alex's father. Do you have a specific department and address for sending donations to the ESA for Giotto?

Better to train the kittens on the laser than the other way around!

POLES OF ORDER 2
APA-TECH 24

TRANSPORTER #19: I'm not sure your remark about NASA is quite fair. If one believes what one reads in The Planetary Report or Space World, NASA does ask for a lot more than it ever gets. The Subcommittee on Science and Technology usually helps work out what NASA might reasonably request, but Congress as a whole has often cut that further of late. "So take your VRM, shut up and be happy."

I think a large part of NASA's problem is in trying to convince Congress and the OMB of the long-range importance of planetary research. The expense of the STS hasn't helped the situation for planetary programs, either. (That's why Doc Consolmagno is going to Kenya for the next two years...)

TRANSPORTER #20: What impressed me about the 3-megawatt radar at Millstone Hill was the contrast with our transmissions at Glenwood, where we think 10 kilowatts is a lot of power. I'd never seen a klystron as big as a man!

A COOLISH FANSISTENCY: Probably the only reason the people at work haven't had you hauled away is because you only posted that cover -- you weren't responsible for it!

Glenn's recollections of Murphy are similar enough to Forward's piece in important details to suggest that the latter is true. This shows how myths get started.

The STS schedule has already gone ker-flooey, but at least it's still a guide to what's going up. It was a surprise to me at the time that crews as large as six were planned...

I always liked something Asimov said about science fiction. He also said that SF was the literature of today, "but, by all means, read other literature: it's quaint!"

My electricity consumption does fall to under 300 kWH a month in the summer. I'll be my rent isn't much cheaper than yours, though. I pay $365 a month for a one-bedroom apartment; this is a rural area: apartments are scarce and is growing demand.

ABANDONED, TIRE-WRECKING FREEWAY: You mention in your list of the plethora of Chicago Bills "...and sometimes Hanes." Does this mean he is occasionally in Chicago, a "Bill" or a "Hanes"?

I'm sure that was meant to be flattering, but I don't think anything I've done would be of interest to a biographer.

So what's wrong with reviewing old books? I plan to give my comments on The Caves of Steel next time. (It's new to me!)

Would Alfred Lee Loomis be the Loomis of "Loomis Laboratories" (formerly "the Physics Building") at the U. of Ill. C-U ?

I am aware that much good science was done by devout Catholics, but very little of it received the sanction of the Church. If I understand it correctly, the Jesuits investigated scientific works to decide what could be set forth in Church teachings, but did not initiate much new study themselves (unless contradictory experiments were simply suppressed or ignored). The historical precedent has been that stable authoritarian organizations wielding great power have rarely been the sites of fertile study; any new ideas which emerged in those places usually took root elsewhere.

A FOOLISH CONSISTENCY

for Apa-Tech no. 25

Jamie Hanrahan

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213-542-9098

special help-pad-the-annish issue

Part of the trouble with contributing to every mailing, I've found, is that I tend to run out of things to say. I suppose this is indicative of the fact that Gail and I have been leading dull, uninteresting lives of late. The summer should be an improvement, what with Renee and Co. coming out here for (among other things) Westerchron and with Greg also at Westerchron and later spending a week with us in L.A. Not to mention the fact that I've volunteered to put together the next A-T...

The lack of interesting-things-to-report stems mostly from the large amounts of time I've been spending at home working on work-related stuff. Fortunately that is going to change; in fact, it's changed already. For the most part, I'm done prepping for new VAX/VMS courses; now that I'm teaching Operating System Internals, there aren't any more courses to learn. (Oh, there are two others after OSI, but they're both just applied OSI and will need very little prep time.) I'll of course be learning more about the material I already teach, but that won't require anything like the amount of "extracurricular" time I've spent up to now. This -- in theory, at least! -- means more time both at home and at work to spend on Other Things. It should also mean a bit of extra recognition within DEC Educational Services; few instructors teach the entire VMS course string, and fewer still have been pushed through all the courses as fast as I have been. I hope so, as an interesting opportunity may arise soon within DEC, and I'm hoping it knocks at my door...

It seems that there is probably sufficient VMS training business in San Diego that DEC could set up a sort of satellite training center there. Now, you all know how much Gail and I would like to move back to San Diego. Guess who volunteered for this possible job? It would certainly make our move easier if

only one of us had to find a new job there... (not that I expect Gail will have much trouble at that; she's fast becoming a full-fledged VAX Unix wizard, and gets phone calls from headhunters on the order of once a week.)

Then again, the reason we moved up here in the first place was that it was far easier for both of us to find jobs in LA than in the highly-desireable San Diego area. Then again**2, both of us have picked up skills and experience that make us far more marketable than we were then... stay tuned for further developments.

I KNEW APAHACKING WOULD PAY OFF SOMEDAY: About two months ago the course developers back east sent requests to all the training centers for help. Seems they were just getting started on the VMS Version 4 editions of some of the courses and wanted the instructors' input.

The memo sat around on my desk for a month; then came a two-week period which I was supposed to use to prepare for teaching OSI. One day I sat down at a terminal and, mostly at a whim, decided to whip a few things together to send to Bedford, MA.

Three days later, I realized I'd generated some sixty pages of mostly-single-spaced typing, not including the various example programs and lab problems that I sent (those had been written earlier).

Gah! I don't know what got into me! I just sat down and started typing... I doubt I could have done that before my involvement with apas.

Oh, well. I lost a few days of prep time, but from the feedback I've gotten, it seems I've gained a few friends in Course Development.

Side note: In one of the many "how to land a job" articles that has appeared recently, applicants were told that if they can write well, they should make a point of saying so, because it's quickly becoming an uncommon and quite marketable skill. The article did not point out what seems to me to be obvious: In twenty years or so, few people may be left who can tell the difference.

OTHER DECNEWS

The IVIS system I described lastish was officially announced at the NCC in Anaheim. They had a demonstration unit there, and it was apparently the hit of the show (from the admittedly-biased viewpoint of the people running the DEC booth; realistically it'd be hard to point to any one "hit of the show" in a gathering that large). Seems it's based on DEC's new high-end "personal" computer (the "Professional 350") instead of the GIGI; the GIGI-based units we've seen here were apparently prototypes,

built to test the concept. For more details, see the opposite page.

YOU DIDN'T READ THIS HERE, FIRST OR NOT: The Large Computer Group (the division within DEC that builds those strange 36-bit-word DECsystem-20's) has dropped the "Jupiter", or 2090. It seems that Ken Olsen, DEC Head Honcho, has finally realized that LCG has had far too much say about what the other product lines will and won't do, and basically told them that (a) if the new high-end VAX (or anything else) impacted the sales of the 20's, it was just too bad, and (b) the assembly line facilities that were destined for use on the 2090 were needed to build VAXes. The new VAX will be announced sometime this Fall, and will have a raw speed at least four times that of the 780. VMS Version 4 will be announced at the same time.

At which time, of course, I'll have to hit the books again... Oh well; it's better than having a job based on an architecture and operating system that's ten years out of date -- like that on the 20. Or, worse, those awful HP 1000's I used to work on.

Speaking of which, the last page of this zine is filled up with a blurb I wrote while working for CTC in San Diego. The funniest (and saddest) thing about it is that it actually is a fairly accurate portrayal of the system I was working on, and the company I was working for. The cruddy type is part of the gag; it was printed on the same line printer used by CTC's customers.

ON THE HOME FRONT

Gail and I, anticipating more time for fanac, have bought a Gestetner 460 duplicator. Perhaps I should say "have stolen", as we're only paying $100 for it, and it was in almost-operating condition when we got it -- getting it running involved merely cleaning the ink gun (did you know that 10-year-old Gestetner ink has a consistency much like rubber? Does) and loosening a few of the linkages with Freon TF (I won't even begin to draw parallels to the consistency of some of the former lubricants that were in the works; some of you reading this may have eaten recently!). Now we're looking around for an e-stenciller.

Where will put the thing (the e-stenciller, that is; the Gestetner fits, sort of, into our "den") is beyond me, but if it helps us avoid all these last-minute trips to copy shops (not to mention to DEC on weekends) it'll be worth it. I'm not using the Gestetner for <u>this</u> zine because we <u>don't</u> have the stencil cutter yet and I have all these other things to add into my zine this time.

In case anyone was wondering, the Olivetti Praxis cuts stencils quite nicely -- with certain typewheels. Others, those with broad strokes in the font, don't do so well.

THE GENERAL TECHNICS INFORMATION HANDBOOK is on again. The next

Professional 350 becomes learning station

A powerful new training tool, combining videodisc and the Professional 350 personal computer, is now being offered to external customers.

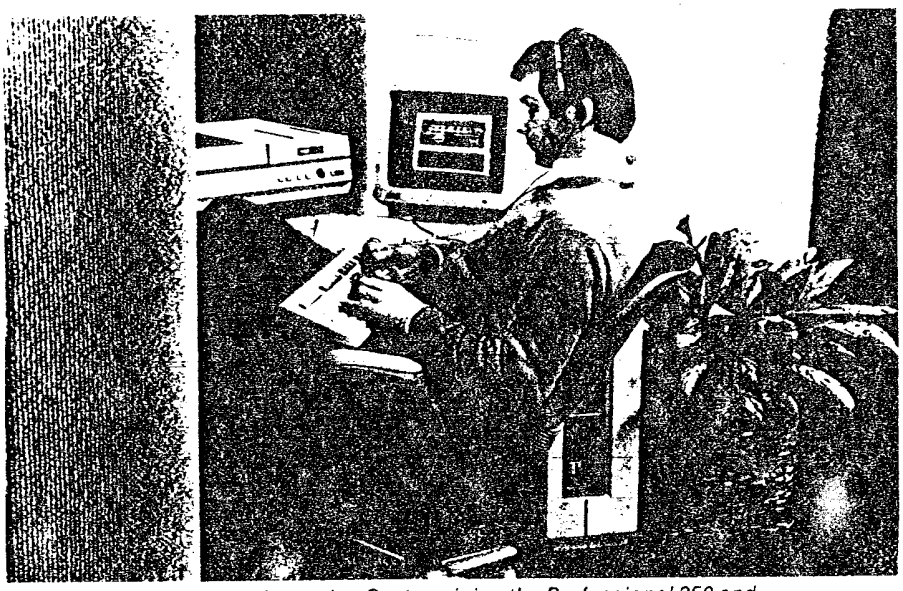
Developed by Educational Services, IVIS, Interactive Video Information System, has been used by Digital's Field Service to train engineers to install and repair equipment and by major customers selected as pilot sites.

"The early results have been most impressive," says Bob DiFazio, product line manager. "IVIS can instruct Digital Field Service technicians to repair an LA100 printer in half the time of conventional instruction methods. Equally important, IVIS-trained technicians can repair their first terminal as rapidly as their conventionally trained counterparts, even though the IVIS trainees have never before seen the actual equipment."

The IVIS option to the Professional 350 allows the combination of computer-generated text and graphics to be displayed over natural moving images received from a videodisc player (or other video source). The Professional color monitor provides a resolution about six times better than a television set.

Graphics and text can be overlayed on still frame pictures or moving images to illustrate or isolate an important point. Sound and images on any one of the 54,000 frames on a videodisc can be accessed at random.

The "courseware" is written in a series of modules presented in a menu. For example, General Motors is using IVIS for a course on how to maintain programmable controllers. In one module, the video image might show a malfunctioning machine and outline and label with graphic overlays the three possible sources of the problem. A narrator explains the symptoms of the failure and how each of the highlighted areas might have caused the problem. The student must identify the problem and key in the response. The narrator then gives the answer with the technical basis behind the correct response.



IVIS, Interactive Video Information System, joins the Professional 350 and videodisc to create a training workstation by combining computer-generated text and graphics displayed over moving television pictures.

At any time, the trainee can check unknown or forgotten words in an online glossary or type in comments or questions. The comments are stored on the disk and routinely gathered by the course developer to improve the courseware.

Educational Services also offers consulting services in the development of customer courseware, programming and video production processes.

"IVIS will be used by large corporations, government agencies and the military for cost-efficient decentralized training programs," says Bob. "Centers can be set up in plants, sales offices, barracks, field offices or on ships — wherever the 'student' works and wherever there is a Professional 350 with the IVIS option and a videodisc source."

Like all components designed for Professional personal computers, all parts of the IVIS system can be installed by the customer and require no tools for assembly. Of course, the Professional used for this purpose is still fully functional as a personal computer.

"IVIS totally changes the economics of education," says Del Lippert, Educational Services manager. "Conventional training methods take little up-front investment for course development, but the on-going delivery costs for instructors and classrooms are very high.

"With IVIS, the initial investment is high, but the delivery costs are minimal. Particularly considering students take courses on their own time rather than an instructor's. And we foresee the cost of developing initial courseware will decline as the tools improve."

To market this unique product, Educational Services has formed a new product line, the Industry/Government Training group. Large industry, military groups, federal agencies and universities have large training programs that will benefit from IVIS.

IVIS can also be used in a variety of other applications, such as advertising in stores, public information centers and on television.

Digital's integrated video subsystem sets new standards as a powerful training tool, and as a system option to the PC350, it sets the Professional apart from all other personal computers in its class.

mailing of Pyro will include a copy of each person's current entry, plus a request-for-confirmation-and-updates. I don't know if I can get a new book out by Balticon, but I'm sure going to give it a shot.

ON TO THE MAILING COMMENTS (on A-T 24)

ROD SMITH: Re yr ct me on machine pistols -- I bow to your superior knowledge on this subject. They do sound impractical and unworkable as a field weapon.

I must ask you to bow in turn to my superior knowledge on hi-fi, state-of-the-art and otherwise. If you really believe that there have been no audible improvements in the last ten years, you haven't been visited a decent dealer lately (I'm not talking about the ones that sell Pioneer, Technics, and that ilk). It's quite true that frequency response ceased to be a limiting factor (for those with unlimited budgets, at any rate) some time ago, but we have only recently discovered that there is far more to accurate sound reproduction than frequency response. I could go on for half a page about the improvements in speakers alone, and then for another half a page about the deficiencies in old amplifier designs that were only recently made audible by the new generation of speakers, but...

For now I'll just state that: Hi-fi is much better than it was ten, or even five, years ago, so much so that the improvements (even in high-end systems) are obvious and dramatic to untrained ears. The reasonably-priced gear has been getting better and better too: You can now put together a system for around $1200 (this includes cassette deck, receiver, turntable, and speakers) that will, in every respect but extreme-low-end bass response, outperform a "cost-no-object" system from the early seventies.

Besides, even if the Digital Compact Disc (my mention of which started this discussion) offered sound quality no better than that of the vinyl lp, the durability of the CD would still be a tremendous improvement. Given even a little bit of care, there's no reason why a CD should ever sound any different than it does when brand-new. And they do sound better than LP's. Much better. Really!!!

On 2-meter FM -- you're absolutely right; that's the only way to go. Besides all the technical advantages, hams are much nicer folks to hear on your radio than are CBers. Maybe with all my newfound free time (see above) I'll finally get around to getting my license...

HIGGINS: You are gleeful; we're jealous! We'd be tickled if we had some friends within easy driving distance! The people we know in LA are few and far between.

On Babbage's experiments with stage lighting: Is this the "prior art" that was found that caused the patents on color organs to be thrown out?

Re ct me on Usenet: No, there isn't a directory. The current practice is to send out a "CQ" message on one of the newsgroups if you suspect someone you want to reach is on the net, but don't know where.

You're probably right about Analog's lead times for science fact articles. I wouldn't know.

The courses I teach last a week. Gail reports that there is a "real-time Unix" within Bell, unreleased at present. I'll send Barry whatever GIGI software I come up with -- with the serial numbers filed off, of course...

Re ct John Frambach: "Not only can't I identify your 'parachutes' quote, but I have no idea what it means." Now you know how I feel. Pfah!

Tell Todd and Mary Lynn that I liked their drawings. But, why does that dragon only have three legs?

BONNIE JONES: Alas, my geography classes seemed to always stress memorization of state capitols, and I was too interested in electronics and whatnot to look any deeper. (Sometimes I wonder how anyone survives twelve years of school with their drive-to-learn reasonably intact.)

GREG: On your mysterious car problem -- check the switch in the transmission that prevents the engine from being cranked when it's in gear. Sounds as if it's flaky, and giving the car a slight push puts it right for a while.

Did you see the letter in Analog from the guy who'd written the three-dimensional ten-digits-of-accuracy orbit-calculator program? I got a copy from him. Want to see it? He says it's in the public domain.

You'd think I could come up with more comments on such a long, interesting zine, but you'd be wrong. RAEBNotherC!

ON THE SUBJECT OF AT 24'S COVER

You're probably going to see a near-infinite number of "Jedi" reviews. And some of you may not have seen it yet, so I'm not going to discuss it this time, but I do have one question for all of you: Does it bother you when the good guys in the Star Wars universe encounter a vehicle for (apparently) the first time, and proceed to run it just as well as (if not better than) the people who were trained on it? It certainly bothers me...

Jamie

COMPUTER TIMESHARING CORP.

Dear HP 2000F or HP 2000/ACCESS System Manager:

Have you noticed that your system is so stable that you haven't had very much to do lately? Worse -- have your superiors noticed the same thing? Have they been giving you busywork... or even thinking about replacing you with a part-time operator?

Well, do WE have an answer for YOU! We offer the CTC 2000G Time-Shared Basic System -- a major enhancement of HP's 2000F.

The 2000G has so many new features that it will take you and your applications programmers at least a year to figure out what you want to do with them all. If you're currently running a 2000F system, you can tell your management that all of your current programs will run without any modifications -- but you really should spend a year rewriting everything to take advantage of the 2000G's extra capabilities. If you're a 2000/ACCESS user, your job security will be assured! Nearly every program you have will HAVE to be rewritten, if you've used ANY of ACCESS's Ascii file functions.

Finally, our system is MUCH less stable than the system you're running now. That means there won't be a SINGLE day when you're looking around for things to do. Every day will bring at least one new problem. You can count on a crash or more a week, with long-term results that might not be felt for months! And since we haven't printed our operator's manual yet, no one but you will have the slightest idea what to do in an emergency.

I'm sure you can appreciate what all this will do for you. Within a few months of installing the 2000G, you'll be able to write your own ticket. You KNOW they won't dare fire you no matter what the cause; where can they find another 2000G guru in YOUR part of the country? Heh, heh! Fill out the enclosed User Information Sheet and send it along with $3200 (no checks, please -- cash, and in small bills), and then sit back and relax while we process your order (that'll be the last chance you'll have to relax for a long, long, time).

Sincerely,

Norbert T. Krelman
Director of Marketing

CTC
the computer people

AN UNSUPPRESSED TRANSIENT (#2)
A.A.A.

Rather Far From Civilization as I Know It.

Santa Fe is 45 minutes from Los Alamos, more or less, depending on the number of reincarnated sloths stuck on the road in front of me. Albuquerque is another hour on the road. I've come to become rather familiar with those times since my arrival here "on the hill." The only movie theater in Los Alamos was converted into a bowling alley shortly before I arrived. White Rock, a sort of suburb of L.A., does still have a theater, but it can be relie upon to show Disney(current), Beach Blanket Bonkers, or last year's hits. Fortunately, Santa Fe is blessed with three respectable "art" movie theaters, in addition to a decent number of mass market, first run type places. (The town of Espanola, about half an hour away from L.A., also has a theater, but I'm tired of navigating through traffic full of "low riders" cruising up and down the main drag in the passing lane, at about 15 MPH. I heard a story the other day that one of those damn low riders had to be towed off a speed bump in the Los Alamos Hospital parking lot) When the Santa Fe film festival took place, a couple of months or so ago, Napoleon hit town with it. Alas, Abel Gance's masterpiece no longer had the live orchestra, but it was just as awe inspiring the second time viewed. As a fringe benefit, Ebert introduced the film, and I believe it was John Houseman sitting a couple of rows back from me. Gee Whiz. The trip to the film was made a little longer by my having to go to Albuquerque before and after, and then back to Los Alamos, but it was well worth it. I have also been taking in some Kurosawa. With respect to visual imagery, I feel that he rivals the silent masters at times.

I've seen most of this years crop of popular and not so popular movies, and by far the most impressive and least flawed of them all is Local Hero. I had the feeling that I was watching a great S.F. movie, but then I realized the movie had as little or less fantastic element as Being There, for instance With great restraint, I'll say no more about this enchanting movie. Despite its obvious flaws, I enjoyed War Games the most of all the rest.

Getting back to the distance of Albuquerque, my first attempt at finding fandom in New Mexico led me to to what appeared to be a gaggle of Trekies and their ilk. Worse, they were embroiled in a parliamentary squabble at the time Unbelievably, they offered star fleet type merit badges for service to their organization. About the only good that I got out of that rather wasted night was a means to contact genuine ~~confusion~~ fandom, also in Albuquerque. Reputable sources claimed that there was nothing closer to where I'm living. The group of trufen was a relief to find after seeing the other group. The meetin was a little more organized than what I am used to, but I'll live. They meet only once per month, minimizing my objection to the distance.(Dick: I did get a chance to give your regards to Bob Vardemann, as he was giving a reading on that night that I first attended) This is the group that puts on Bubonicon, the springboard to each year's WorldCon, as its traditionally held the weekend preceeding the big Con. If you think you might make it to Bubonicon, drop me a line and I'll organize something interesting before I caravan off to CrabCon

Talking Shop.....

Los Alamos is scheduled to get onto Arpanet sometime late this summer. I have gotten the impression that this is a good thing. Why? Late summer also brings Vaxima to the labs, a decent version. Vaxima is the VMS version of the symbolic, algebraic text manipulator designed at MIT as MACSYMA. Apparently, a decent version for the VAX on UNIX has been around for a while, brought to you by the good folks at Berkely. A rather limited subset is also available for micros called MuMath, if you have CPM; I think some people in Hawaii are responsible. Although I have yet to have the pleasure of flying this nifty piece of software, I have seen its potential. It plays with symbolic mathemat ical data, according to the laws of algebra and calculus, as the usual high-level languages operate on numeric data with the laws of arithmatic. For appropriate applications, this software is as much a jump in the saving of labor as APL was over FORTRAN, and FORTRAN was over machine language.

Talking of neat software, after reading the writeup in the April issue of BYTE, I have high hopes for MODULA II. MODULA II was designed by Wirth, the guy who designed Pascal, as a superset of Pascal, keeping the good and curing most of the problems.

Getting back to MACSYMA for a moment, I remember, in my freshman calculus, getting a kick out of differentiation, but hating integration, cause differentiation was a science, but, as I rationalized it, integration was an art: I was told that the question of whether something has an integral or not was an open one. To my surprise and delight, while investigating MACSYMA, I came across a landmark paper, submitted to the Trans. of the AMS of May,'69 by Robert H. Risch, in which Risch submitted and proved an algorithm by which one can determine whether or not an elementary function will yield an elementary indefinite integral. The days of darkness are at an end! (pardon me, I have been temporarily been infected with a flair for drama. With luck, it will pass.) This paper is partially responsible for the power of MACSYMA. Knowing of this rather powerful tool, I have developed the prejudice that most every application requiring numerical approximation, should be preprocessed by MACSYMA or one of its cousins. If by now, you are just itching to get your paws on this paper, Risch states that "The reader need only be familiar with some standard facts from algebra and complex analysis in order to understand this paper." Be forewarned: he name-drops quite a few morphisms on the first page which had no definition in any of my abstract algebra texts, and it seems to get worse from there. Personally, I recommend at least a good masters in math for a good understanding.

For those of you, like Marty, who are into playing with esoteric software, you probably already know that a CPM-micro version of PROLOG is now on the market. Apparently, PROLOG is what the Japanese are using in their fifth generation micro project. Have fun.

No Longer Talking Shop.....

For the record, I just have to say how disturbed and upset I am following our Secretary of the Interior being called in on the carpet for this trivial Beach Boys bull shit while otherwise receiving tacit approval for genuine and substantial offenses as I see them. Ah..., that feels beter.

Oh! Oh!, I feel another Reagan tirade coming on again: please bear with me. This time I'm ranting about education, or rather the lack of it. Our fearless leader, as far as I can tell, hasbeen paying only lip service to this issue. I must admit that the old man is extremely adept at rhetoric. I read some stuff in this April's issue of Scientific American that really scared me. Let me relate the figures presented in Science and the Citizen: of the 140,000 students at the U. of Cal., 22 are ENROLLED in programs leading to a certificate in math, and 47 in ANY program in science certification. The figures for the Cal. State system are similar. We all know the exorbitant cost of living in the San Francisco Bay Area; the begining teacher there can expect to rake in an average of $12,680 as an annual salary. On top of those things, the article goes on to state that half those trained never go into the field, and of those who are teaching now, a fourth are planning to leave. Only a third of all high schools offer a course in calculus, and even fewer have someone qualified to teach physics. The cumulative effect of these problems can be seen in a paper in the same issue. The paper deals with how students at a good university [illegible] predict the simple motion of a released object. I was appalled at the results.

A few weeks ago, I travelled once again to Albuquerque to take in the International Science Fair which was being held there. I was extremely impressed with a good number of the projects: they were outstanding. But far too many, I felt, were merely excellent and quite a few were only good. Considering the number of students available to compete for an invitation to this most selective fair, I feel that virtually all of the projects representing their broad regions should be of an outstanding nature. Things must really be bad out there. On the brighter side, I also got the impression that

that there will always be outstanding talents emerging regardless of their educational environment.

Of course, the obvious solution to the problem of too few good teachers of math and science would be to give in to the simple economic law of supply and demand by paying them a competitive salary, a salary above that of other teachers having less marketable skills. But we all know that this is fancy: the powerful teacher's unions will never allow this. What is there left to counter this worsening trend? The automated classroom, having interactive individual tutorials on a classroom micro system, created by the best in the field, would aid a majority of the students, but leave exceptional students, in both directions, who need a live knowledgeable instructor, out in the cold; Major high-tech corporations are getting tax and other benefits for donating equipment to schools. Why not also donate quality manpower: allow some of their established personnel the option of taking a fully paid leave of absence periodically to teach after the appropriate qualification. The larger corporatinns will directly feel the results of this investment in a number of years. The only other option that I have been able to come up with is for the Scouts to be revamped, reorganized, and revitalized to deal with this current and modern dilemma. I would love to hear other input on this subject. (Just arrived in the mail, I see that Science News has taken up the clarion on this issue)

A passing note: yet another paper in this issue of Scientific American describes a theory that Quarks are not the fundamental particles we had thought they were. This is idea that I too began forming, though at the most elementary level, soon after the taxonomy of the quarks began burgeoning. May this new theory prove fruitful.

What this area may lack in civilization is compensated for, in spades, by the archeological treasures and the natural splendor--often found together out here in the southwest. Bonnie, you would have a field day, or month, if you ever saw this place. This month's Scientific American(again) presents a paper concerning giant calderas, huge mega volcanos. Los Alamos sits upon a mesa created from the ejecta from the Valles Caldera. This ejecta, being very erodable, has allowed, in a short time geologically, the landscape to become rather well sculptured. Many of the bare cliffs in the area are quite smooth and pockmarked with a multitude of holes and shallow caves distributed over the entire surface with some regularity, making me think that they had become the home of a colony of gigantic woodpeckers(rockpeckers?). The Amerind natives, centuries ago found that these cliffs would provide fine homes, with a little work; an agrarian society soon resulted from that venture A great place to find a lot of this is the Bandelier National Monument, a nice bicycle ride from the town of Los Alamos. My apartment itself is a few houses down the street from a national forest area. I have stepped out my door, and in about fifteen minutes, have been at the top of a small cliff which provides a fantastic panorama of the entire area. Because of the quite hilly terrain involved, I find that commuting to work via my bicycle is a great workout. I can't remember ever being as healthy as feel I am now.

Transient Spikes.....

A couple of weekends ago, I found myself driving to Salt Lake City, with Keith Halperin, to attend the wedding of a mutual college roomate of ours. We left Albuquerque at about 10:30 on thursday night. We got into SLC about 14 hours later, delayed by huge detours, road construction, and flooding. That weekend, it was miserably hot--in the nineties. The week before, I discovered, Quite a few inches of snow fell on SLC itself, not to mention what was dumped on the virtual glaciers on the mountains overlooking SLC. I would have been surprised to not find the flooding. The building where the wedding and reception were held was located in the most inaccessable location I have ever had to find. Getting there involved taking the exit looming under the shadow of the Utah State Pen, going through the barrier

which restricted access to a road that appeared to lead right to the prison, but really doglegged around it; from there we had to navigate detours, turns onto unmarked roads, and inaccurate and inadequate directions. We weren't the only ones who had problems: Getting there ten minutes before the ceremony was to begin, we found ourselves the first guests to have arrived. Of those who eventually did find the place, almost all were late. After all that, the wedding was very nice. But somebody's got to show those Mormons how to throw a reception; I guess it was a reception that followed, but I'm not all that sure. Afterwards, we spent some time playing tourist in SLC. It really is a nice town, though I was annoyed by the streets which they had barricaded off to handle the flood waters--in the middle of the city! The return trip to Los Alamos and Albuquerque was not uneventful either.

Heading South from Provo, the State Police stopped us to warn us that the bridge we had to cross might be washed away by the time we got to it. We got across it in time, but it sure made life interesting. We then made a slight detour in Southwestern Utah to tour Arches National Park; it was fantastic! I highly recommend this place. The scenery along the highway between Los Alamos and SLC was, for the most part, spectacular. The terrain would probably drive Freud crazy. Its amazing what a million years of erosion following tectonic upheaval will produce. The final adventure was the so called state highway between Cuba, N.M., and Los Alamos. It started out as a sort of alley and then degenerated into what I can only describe as a jeep trail: for about 40 miles, it was an unpaved, rutted dirt road that the signs said was impassable if the weather was bad, like snow or even rain. In some parts, I got the impression that the road had been cut to avoid cutting down any trees. It was four in the morning and I had a blast. No stretch of road has ever challenged my driving like this one has. It was sort of like the forest flycycle scene in Return....

Jamie: In answer to your question, the program I am emplyed in is for one year, but I am considering getting an extension to that period--something which I here is not unusual. The reason for this is that I have yet to find a graduate school which has provisions to give money to students who enter in the winter; some don't even allow midyear admissions. I guess I'll just have to continue making money for a while longer. Aw!

At the end of April, the Lab celebrated its 40th anniversary. I'll tell all about this event in the next Apatech.

I'll close this iss. talking books. Not having homework hanging over my head anymore has allowed me to read more than ever before.

I went on an Ellison binge--'nuff said. I finished a couple of tetrologies: Dune, and The Book of the New Sun. The less said about the Dune books, the better. The Wolfe books gave me a great image of the Earth after millions of years infected by genus homo. I have become a rabid fanatic regarding the works of Edgar Pangborn; I have never read better. It gets my strongest recommendation. I have found the Thieves World books to be interesting, though S&S is not my usual fare.

The three old masters have novels up for the Hugo this year. Not being able to choose the best by comparing them, I have resorted to comparing each novel with its author's others. As I see it Heinlein came closest with Friday to his best, standard, or whatever, than did the other two; its classic Heinlein. Pride of Chanur is a fine book--too bad it had to come out this year of sentimental favorites. I was surprised and delighted with what is for me a new find: The McAndrew Chronicles by Charles Sheffield. Its great hard SF; I liked the characterizations too, but don't go by me, I like Hogan's characterizations also.

Well, I'm out of space and out of time(locally). Later.....

Andy

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(617)540-3250 (548-1400 x2421 work

Down to the Sea with Chips

Greetings folks! After a delay of several months I'm jumping back into the habit of writing. The delay has been caused by the process of acquiring personal computers and the recent appearance of a woman in my life. I'm sitting in front of both now, word processing in eight different colors!

Gawd, I think I've gone round the bend. So far this year I've bought two computers. I'll describe the NEC in a later paragraph, but right now I'm at coffee break at work typing this on my Trash-80 model 100. For two years we've been waiting for the Dynabook to show up. Now, an acceptable version has fallen out of the sky.

The model 100 is the same size as the average 3-ring binder. It can be expanded to 32K of RAM, though I've only got 8K at the moment. It comes with text processing, scheduler, telecommunications, & address filing software. Hardware accoutrements include an RS-232 and Centronics port, an auto-dial direct connect modem, cassette and HP bar code interfaces, and an 8-line by 40 char. display. For more info see the May issue of Byte. The documentation still weighs less than the computer, but not by much! The best way to buy it is to find your nearest Radio Shaft warehouse and buy one of the "damaged goods" ones. This usually means that the box will be dented, but the warranty is still good. The computer usually isn't damaged. If you can find one that has actual damage to the computer itself, you should be able to get a real steal.

My other new machine is a NEC Advanced Personal computer with two 1Meg 8" floppy disks, 256 Kbytes of user ram, eight color display with text overlaid on top of a 640 x 470 graphics window into a virtual 1K x 1K graphics display. It has an 8086 processor and I intend to install the 8087 math co-processor in the future. I'm running CP/M-86 with graphics extension and I will be getting the MS-DOS operating system as soon as it is released. Do any of you still wonder about my being low on funds?

The word processing program is The Benchmark. It does have its quirks and peculiarities, but once you understand them you can start to effectively use all the other whiz-bang features (such as the mailing list manager sister program). It does have some real nasty problems, but since it's the first word processor I've used that isn't a dedicated machine I don't know if those problems are typical of all personal computer style word processors. I haven't dug into Wordstar, even though it works on my machine, but I don't think it has as much in the way of power and features as Benchmark has. No question about it, for most folks the extra power is superfluous and Wordstar would be the better choice. Since the interfaceability of files generated by Benchmark is questionable (text files are sub-files of CP/M files known as Storage Units), Wordstar will probably remain a better program to use for file generation.

I managed to glom onto a Centronics printer at a WHOI auction for only $10. It weighs 155 lbs. and prints at 120 characters a second. When I got it home (by myself and without a hernia), it turned out to work perfectly. It had an RS232 interface and only printed upper case and numeric characters. I hand coded a 2716 EPROM to act as a character generator (all those little dots!) and interfaced it on a small babyboard to the Centronics board. It is now working as a cheap and fast hardcopy output device. But since it is using the parallel port on the NEC, if anyone needs a Centronics RS-232 interface with manual, let me know. It may be a long time before I can afford a letter quality dot matrix printer.

The NEC computer just happens to also be the official microcomputer of the WHOI administration. Lots of software crawling around this place, and lots of neat programs being developed as the machine slowly worms its way into other areas of the institution. Right now there are about twenty machines scattered around. Three of

them are color (just like mine) and reside on the same floor that I do. Two of them will shortly be making ~~its~~ their way to the arctic. Some of them have letter quality printers. I made a deal to bring up one of the new systems at work in exchange for rights to occasionally use the Spinwriter that is with it.

The previously mentioned woman has wormed her way into my heart over the past few months. I'm no longer a lonely soul living on the Atlantic shores. We met at a square dance in Woods Hole back last Fall. 1) Her name is Bonnie Chapline. 2) I took her to Boskone and she drooled through the entire masquerade (she qualifies for SWOF too, I believe). 3) She is quite crazy enough for me. 4) Her existance is a rational impossibility, as I haven't found one thing about her that I dislike (well, she did leave the dishes a little greasy after I cooked a cheese casserole - but that doesn't count). 5) She is studying physical therapy at University of Mass. in Boston. 6) She's good at hugging, massage, and uh, other stuff too. 7) She's moving in today (this today being May 30, not to be confused with other todays that may appear in this contribution that I have forgotten to edit out - time travel via word processor again).

Those of you who know how small my apartment seems when filled with my stuff alone, fear not. Remember also how much stuff I can cram into my Honda. I sometimes feel like a forth-dimensional adept.

The Honda, by the way, is not much longer for this world. Whilst trying to miss someone who pulled out in front of me, I rode up on too tall a curb, and fractured off an engine mount. But besides that the rust is taking over, a brake rotor fractured a few days ago, the carburetor is acting real funny, and lots of other minor things are going rong! Methinks Piglet is preparing to commit suicide. Hopefully he will get us out to Rochester one more time before becoming a strictly local vehicle. I start saving next month for my next Honda.

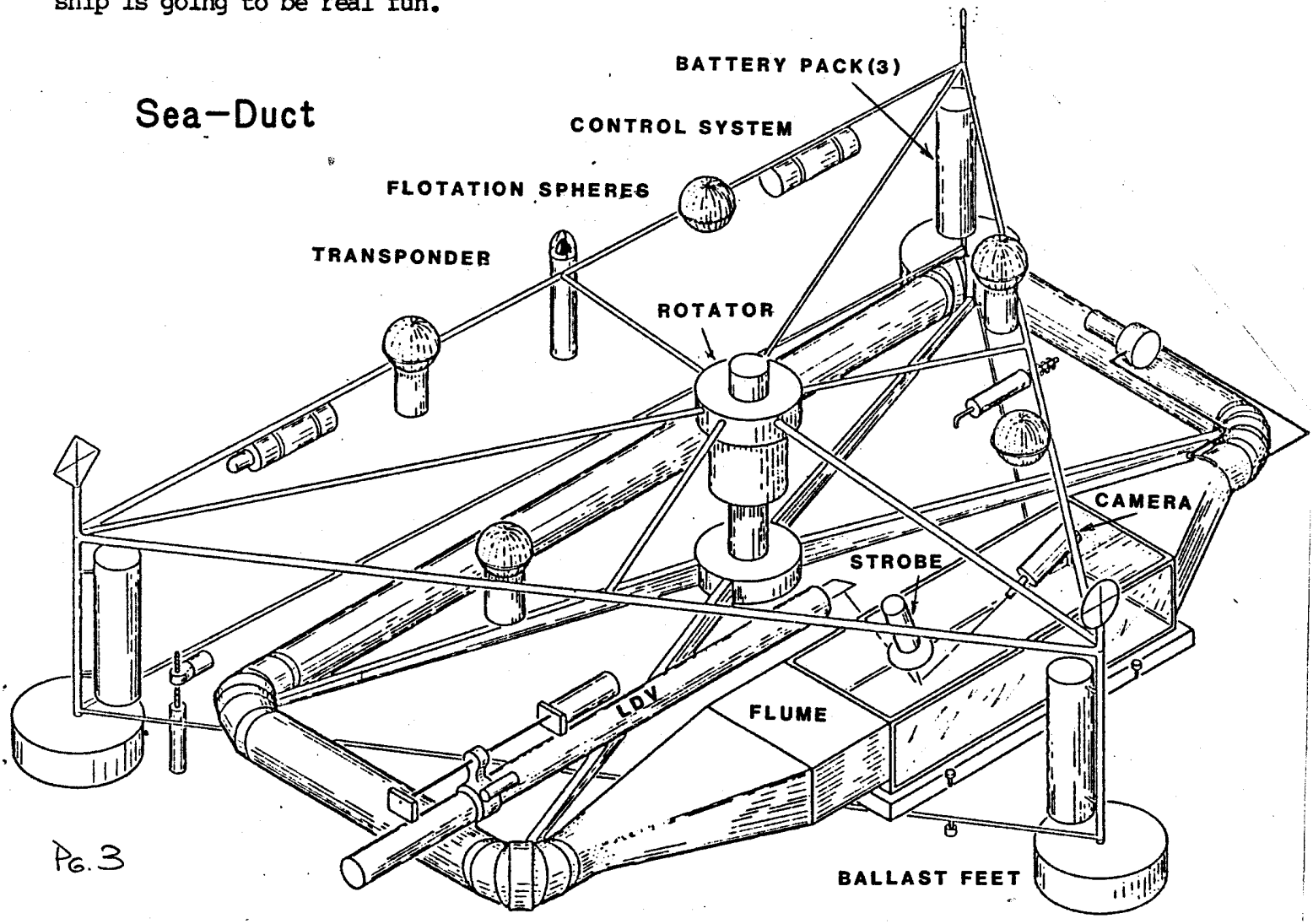
Several weekends ago Bonnie and I went to the New England Folk Festival outside of Boston. There was lots of dancing, singing, mini-concerts and workshops. I still haven't learned how to play my MacArthur Harp, so I didn't do any playing there this year. I have finished an information request sheet for the harp (even though it's technically a member of the zither family) that I plastered around the high school where the festival is was held. Someone may even know something about the harp and respond, but after a month nobody has.

From about the beginning of May to the middle of June I am once again working hellishly late doing theater lighting. The Woods Hole Theater Company put on "The Learned Ladies" during May, and I did lighting design and crewing for it. I'll be crewing for the dance stuff going on in June at the Highfield Theater. The only consolation for crewing at Highfield is that the refrigerator is kept stocked with (free) beer and pop.

It doesn't look like we'll be getting to any conventions in the near future. I say we because I decided at Minicon that leaving Bonnie behind resulted in a less fun convention. Besides which it didn't <u>feel</u> right leaving her behind. Since two cost more than one, the result is half the conventions - Bonnie can't afford to pay for airfare being a student. But Empiricon in NYC may warrant a one-day trip, if only to catch Bermuda Triangle. The Rochester Berserker is a definite gottago. Constellation will probably be the next full convention we go to. Windycon probably will not see us around unless very low airfares pop up.

My first batch of homemade soap is curing on the counter. I got 35 bars out of 18 months worth of cooking greases and oils. I thought it would be interesting to try doing. There were some minor problems, but they seem to be clearing up. The PH is dropping as the fats saponify. I'm pretty sure my hair won't dissolve because of using it. It seems to work better than the economy stuff found in the generic section of the supermarket. It does take a little longer to rinse off, but I can't beat the price!.

At work I've been working on several projects. The first of these is the Sea Duct. Since it is impossible to bring ocean bottom sediments to the surface and have them retain all their important properties (such as cohesion, living organisms), we are going to send a sedimentation laboratory down to the bottom to do in situ experiments. The major item involved is the "flume". This is a large hollow rectangular toroid with a glass walled box located along the flow path. The bottom of the box is open and has a sharp edge to penetrate into the ocean bottom and make a seal. The inside of the toroid becomes a closed loop. The glass box is the test section where we peer into the flow of water and perform our measurements. The flume is on the order of 20' x 8' and is mounted within a larger tripodal structure. The flume is rotatable within the tripod. It gets aligned to a predetermined (by photographic surveys) orientation, and gets rammed (gently) into the muck by a hydraulic system. Once the test section is secured in the mud, a pump starts circulating the water around inside the closed loop of the toroid. Photographs are taken of the area in the test section to record visible erosion effects The amount of sediment that is picked up by the moving water is recorded by measuring the transmission properties of the water. Core samples are taken of the sediments just outside of the test section. The instrument (nay, laboratory) then drops its ballast feet and returns to the surface for recovery. JPL was supposed to have designed and built the test section under a technology-transfer agreement, but they spent a million bucks and only produced a batch of drawings and a flimsy plastic prototype test section. They produced essentially no useful information! Guess who's on <u>our</u> shit list? The Office of Naval Research is apparently none too pleased either! The instrument has fallen behind time and needs a budget increase now that we have to redesign the flume and build it too. The instrument is going to be monstrous in size. Launching it off of a ship is going to be real fun.



This drawing has the tripod not to scale, but the general layout is correct. The LDV is

I've been back to work on the LDV - the Laser Doppler Velocimeter that is supposed to non-invasively measure water velocities and very small scale eddies and turbulences by reflected laser light from suspended particulate matter. My task this time was to build a battery pack disconnect that would sense the voltage on three batteries and disconnect them all if any one of them fell below certain preset voltages. We didn't want the battery pack to discharge to the point where any of the cells started outgassing. Having an instrument pressure case filled with power electronics and a pressurized stoichiometric mix of hydrogen and oxygen on your hands is no fun at all. There are many ways to make cheaper bombs! The LDV left on another test cruise a few days ago. It's working an order of magnitude better than it was when I last worked on it, but under laboratory conditions. It has yet to work in the field. The instrument is out on another cruise right now, and we haven't heard how it's been working. Last cruise the only problem was that there wasn't enough suspended particulate matter for the LDV to see.

For a few weeks I was working on the Pop-Up Profiler's probes again. I had to boost the efficiency of the acoustic transducer system, drop the power usage, and drop the cost of parts and labor for these disposable electronic packages to below $200.

This week I'm working on 5 Mhz (that's right, Mhz) acoustic distance ranging units. They get mounted on the tripods at exactly 0.5 meters above the foot pads. Every 10 minutes they give off a pulse and measure the return time from the bottom. We can find out exactly how far into the mud the tripod has sunk upon landing, and whether or not it is slowly sinking in further. Because of the high frequency, the accuracy is great - on the order of 0.5 mm. Most of my part of the work involves assembly of the units and testing of the microprocessor data loggers. Each unit can make 500 measurements before it shuts down. As I'm an idiot when it comes to RF, someone else gets to worry about those sections. I've been using the Model 100 as an intelligent terminal to check out the data loggers, and am growing more impressed with its capabilities every day.

I'm starting these mailing comments while sitting in my car, waiting for my laundry to finish processing itself (who was it that laughed last summer when I claimed that I was going to be able to do word processing in my car?). I'll finish them up on my NEC, but this model 100 is getting neater and neater all the time. Come fall, I may buy another one for Bonnie rather than let my sweaty hands part with this one!

Issue 22:

Bill: I'm learning "C". More people than Marty have suggested it to me. It seems to be the programming language for non-military programmers for the 80"s. ADA may pull ahead in the long run, but I think C is gaining over both it and Pascal.//Will you be building the first GT version of the Repairvision, using your pilot's helmet as a start?

Bill-El: Does the talking coke machine have any style of accent? At the CES show a few years ago Todd saw a toy/game of some sort that had a voice synthesizer that spoke with an "urban Negro" style accent (no racist intent, I just don't know how else one could describe it).//I tore apart an anti-theft label from an album I had purchased a few years back. It was nothing more than a square spiral of metallic foil laminated between two layers of plastic under a pretty label with the store's logo printed on top in color. I assume that most of the other theft systems are similar - passive resonant devices of some sort that make a large disturbance in an electromagnetic field. The anti-theft bag may be nothing more than a layer of aluminum foil used to shield the resonant device from the transmitter and detector panels.

Donna: Lots of suggestions, but I don't see you volunteering to do any of the work.

Issue 23: Cover; Gentlemen: Hot on the heels of the recent Graphics extension, Digital Research is rumored to be releasing the CSX - Cartoon System eXtension. Sad to say, but once again technology races on, leaving most of us in its wake.

Jamie: One of these days I really will remember to send you an album listing, but the one I have is so out of touch with what I actually have that I have to redo it. // Contrary to your experiences, my Windham Hill recordings are some of the best I've ever gotten. Is it like polish mead where they export all the good stuff and keep the junk at home for the peasants to consume? // I hope my saliva supply lasts until CD disks and players become the standard, cheap source for music! // Does the GIGI system software use the CP/M graphics package for Plot-10 to talk to the terminal, or is it tied to the machine with woven steel cable (i.e. how can I get that neat editor for my machine).

Donna: I don't know what the database would cost or what it would do. The reason for having any kind of database or program is to solve problems or make life easier. I can't justify the time and expense just so folks can say that it's neat that it exists - it has to do something. My question was probably worded the wrong way. I should have asked what people need to have done for them that they could not have done without a database. So far there have been no suggestions or needs presented, so I doubt that anything will happen. // Do you folks have any suggestions for good books on putting up walls and drywall, or should I just wing it?

Greg: Both you and Higgins cause the same problem to occur in me: you print so much stuff that I'm unable to figure out how to do comments to you in a coherent and concise manner. Lotsa neat stuff, but I haven't figured out how to comment without running into reams of paper! Someday, though..... // Where can we mortals see some of this "Star Flight..." stuff?

Keith: You are not the only one who feels like he is growing away from fandom. I've noticed more and more how I'm enjoying conventions less and less. The Berserkers and such are still as good as ever, because I'm dealing with friends, not fandom. If it hadn't been for GT I probably would have dropped out of fandom long ago.

Valli: Nah, I'll still go shopping with you - as long as you wear one of those electric dog collars so I can keep you under control! // What you call your zine doesn't matter. // Dunno what con I'll be at in the future that I can bring Bugs to. Maybe Conclave if flights are real cheap.

Greg: you again? Boy, you really do want comments. I'll leave off here and start with you next time.

I've got the following stuff for sale to anyone who comes up with cash or trading goods. First come first served, products offered as is though I'll tell you about all the faults I know of. Shipping will be added on top of the costs of the goods unless I can conveniently carry them along with me to a con or berserker.

SSM 2000 series electronic music IC's VCO, VCA, VCF, ADSR's. Dozens at $5 to $6 each.

Sanderson Private Pilots Course with computer, plotter, FAR & AIM regulations from 1979, 1 yr. Sport Aviation back issues. $30.00

Allied Portable 6-band radio - broken wire in tuner so only FM & PS bands work, antenna broken. $12.00

Laser Power Supplies 5 mA constant current, High V start $20.00

Allen-Bradley type J, 2 W, 100K linear pots $ .50

50K wirewound trimpots 1/2" square lots n' lots $ .50

Cordless soldering iron (cheap radio Shack type) $ 4.00

Three prong twist lock panel sockets Forty for $15.00

GE (Gates cell style) 12V @ 5A.H. lead acid battery $25.00

SWR bridge & field strength meter $ 4.00

4-cell battery charger for ni-cads $ 3.00

Polaroid roll film camera $ 5.00

Integrated circuits:
4016 4066 4069 LM380 7400 7401 7404 7408 7410 7411 7420 7430 7437 7451
7452 7455 7464 7473 7474 7485 7486 74126 74138 74153 74157 74158 74174 74175
74183
74195 lots of other types in less than stupendous quantities

Metal Clarinet - Elkhart Silver Plated - bell dented $200.00

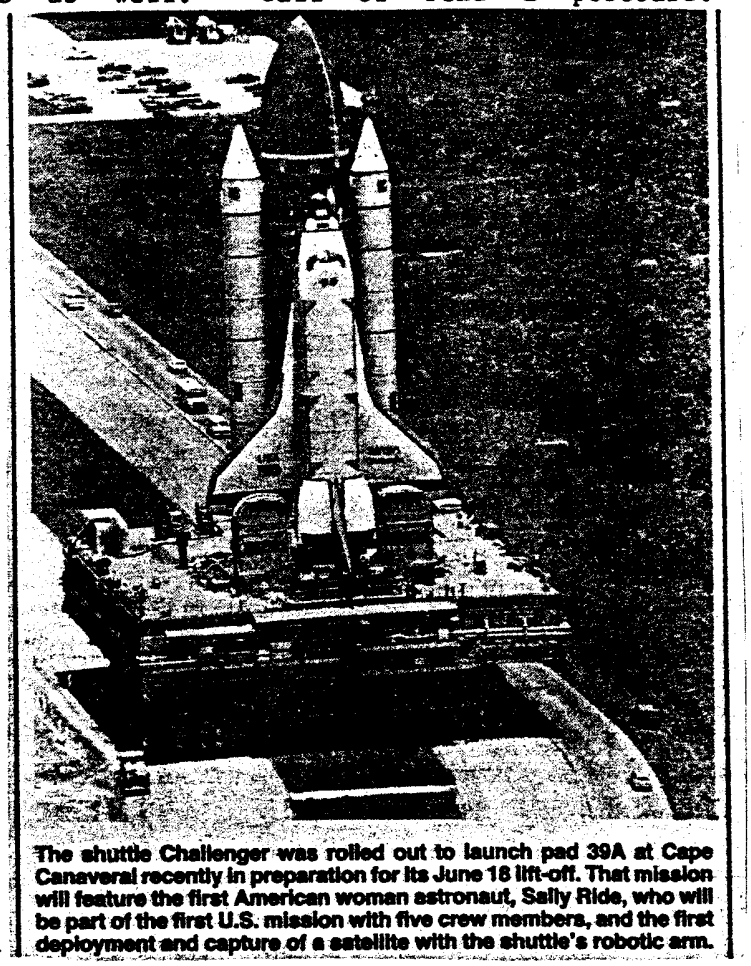
Starlog Issues 1 thru 19 excellent condition $30.00

Cinefantastique Issues V6/3 Wicker Man; 7/2; 8/4; 9/1 Alien; 9/2 Salem's Lot; 9/3&4 Black Hole; 10/1 Carpenter; 10/2 The Birds; 10/4 Cronenberg; 11/1 Dick Smith/Altered States; 11/2 Altered States; 11/3 Conan; 11/4 Harryhausen; 12/1 Ghost Story; 12/2&3 Conan; 13/1 Creepshow; 13/2&3 The Thing; 13/5 Something Wicked $2.00 ea., $3 for double issues.

PFRC Club Pix '78 Bookshelf, '79 Cylon, '80 Bar: 5x7 B&W $4.00 ea.

I have a vast array of other parts as well. Call or send a postcard.





The shuttle Challenger was rolled out to launch pad 39A at Cape Canaveral recently in preparation for its June 18 lift-off. That mission will feature the first American woman astronaut, Sally Ride, who will be part of the first U.S. mission with five crew members, and the first deployment and capture of a satellite with the shuttle's robotic arm.

HUMMED ON VERANDAS

****

Once again W. Skeffington Higgins unleashes his Great Thoughts upon the hapless world. But is anybody listening? Don't bet the ranch on it. This document is Spinthairiscope Media publication number Twenty-One, for Apa-Tech 25. (Can this be our fourth annish?) This hoax originates at 853 Lorlyn Drive, Apartment 1A, West Chicago, Illinois 60185. Phone: (312)293-1050. Office address is MS 220, Fermilab, Box 500, Batavia, Illinois 60510.

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Strictly Second Class

Some of the stuff I get in the mail these days:

NOW YOU CAN JOIN THE THOUSANDS OF MANAGERS WHO FEEL COMPLETELY AT HOME WITH COMPUTERS, COMPUTER LINGO AND ALL THE WONDERS MODERN TECHNOLOGY HAS TO OFFER.

It's painless...
it's easy...
and it only takes three days!

* * * * * * * * * *

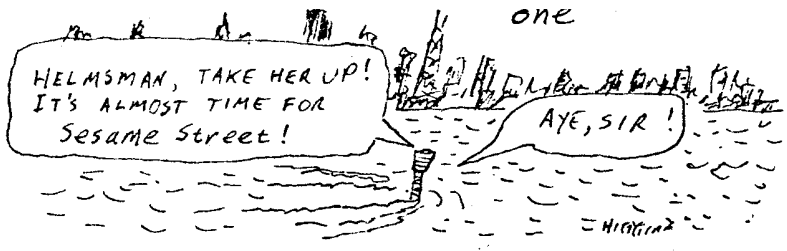
The Single Professionals Society will offer a program on "How to Select a Mate in One Hour," and "How You Can Learn Whether Another Person Is Right for You in Twenty Minutes," led by Bruce Johnson, personal counselor, on Friday, April 8 at 8 p.m. in the Glen Ellyn Holiday Inn. ("Sorry, honey, but I'm afraid your twenty minutes are up. You're nice, but you're not Right For Me..." Damn! I've wasted so much time on this! Between the Sixty-Minute Mates and the Three-Day Computers, I could have had a lot more spare time in the last ten years.)

* * * * * * * * * *

FOR ATARI
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as it is in the Book of Genesis. Text in King James version. Learn original Hebrew words. High res graphics. Over forty frames! Creation of Man in animation. A learning experience. Disk only. 48K $19.95

* * * * * * * * * *



The USS Silversides is a floating museum moored at Navy Pier, one of the most famous surviving WW II submarines. Kids can stay overnight; call 884-6312 to make reservations. Otherwise, a tour is available daily after Memorial Day from noon to 6:00.

(Jeepers, Mom, can I go to the Underwater Slumber Party? Pillow fights in the torpedo room. Asleep in the deep. Ghost stories around the periscope. No wonder they don't start the tours until noon; it probably takes all morning to clean the boat up after the kids leave...)

* * * * * * * * * *

the
Whole Again
Resource Guide

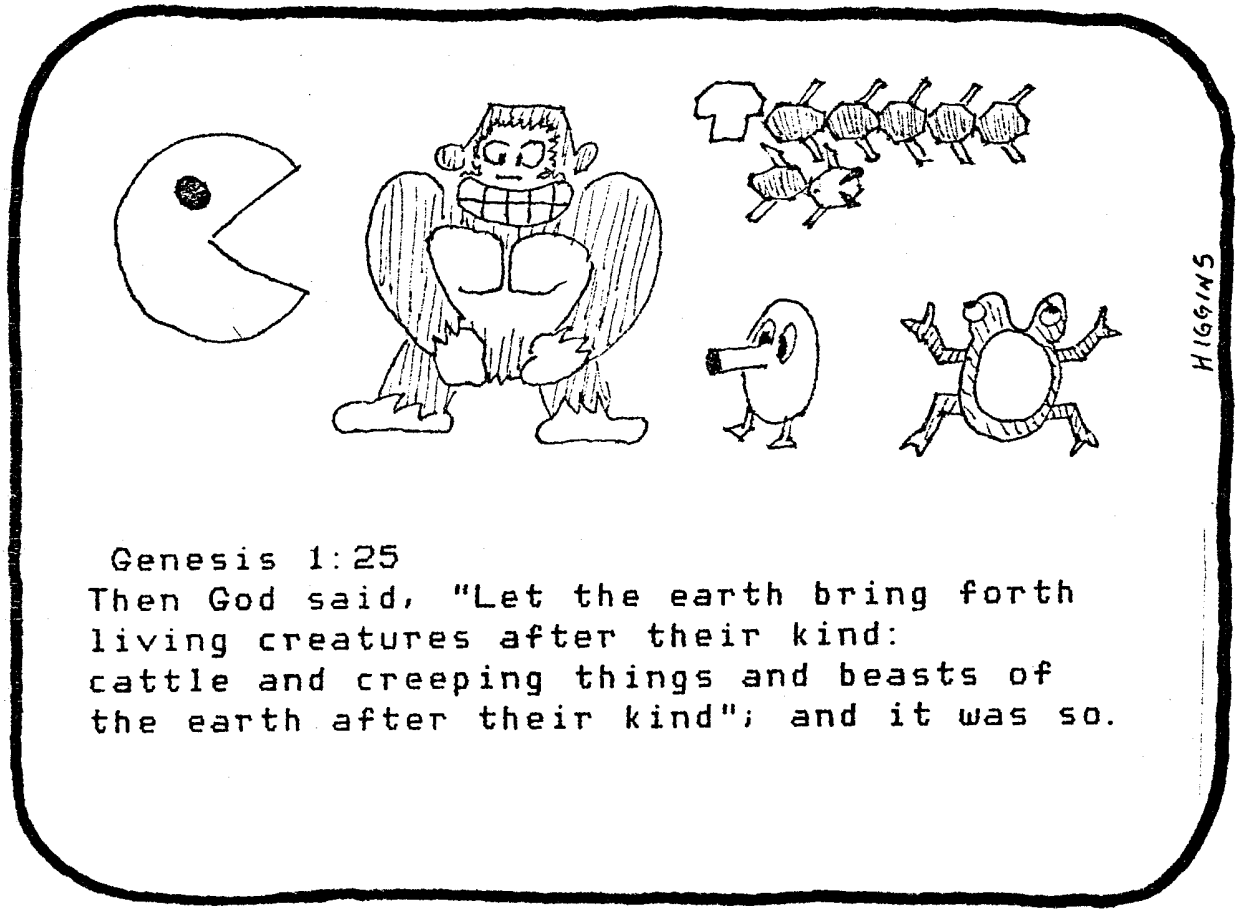
An empowering tool for personal growth and planetary wholeness

...for seekers and questors towards new ways of being.

Whether you are a networker, an author, a scholar, a librarian or an explorer wending through the passages of life, the GUIDE will widen your horizons, providing you with a practical compendium of tools and resources for people-saving, planet-saving alternatives... The listings are divided into over 35 chapters, each with an introduction, and contain such headings as appropriate technologies, channeling, conservation, cooperatives, diet, holistic health, human rights, new age, psychic studies, sex roles, spiritual growth and UFO's.

(I resist a powerful temptation to comment-- the copy speaks for itself-- except to note the planet-saving holistic new age punctuation, which omits the old age comma preceding the conjunction in a list of three or more items.)

* * * * * * * * * *



FOR SALE

Autoclave 10 ft. dia. 100 PSI Automatic door. Shell only. Internal operations. Your choice. Vessel only. (918)835-3999.

(Sterilize your car! Your stuffed elephants! Your softball team! Does "Internal operations" mean you have to be inside it to work the thing?)

* * * * * * * * * *

Golf's AMAZING NEW Wonder Instrument....
PuttOScope
Golfing Tutor
A scientifically designed optical instrument to improve your putting

(This is a periscope that clamps onto your putter so that you can see the ball rushing up at you.)

If you miss the putt you have no way of knowing why you missed it. If you sink the putt, was it because you did everything correctly or was it the result of a number of intercompensating errors on your part and if so can you rely on the same mischance repeating itself?

...PuttOscope will tell you from which address position YOU can best read the line to the hole. Don't be afraid to experiment with different stances for lining up and stroking the ball as it is highly improbable that the conventional square stance is the best for both executions.

How Much For Three Arms' Worth?

"And if you do come down next weekend," Cathy Hudson told me, "you can go to this bookstore that's offering All You Can Carry In One Hand for five dollars!"

I didn't really expect to, but we were tooling around West Lafayette one afternoon, and Jim Swain needed a software manual, so he and Cathy and I wandered into a bookstore. Hmm, a few interesting titles here on the remainder table. Then, spotting the signs, I realized two things: this was the bookstore Cathy had mentioned, and it held a few books I might like to own. I started digging.

In a situation like this, where the marginal cost of adding another book to your purchase is negligible, your strategy should be "when in doubt, throw it on the pile." Thus I collected not only a few books I would have bought anyway at reasonably low prices-- such as Cameron and Field's The Dusty Universe-- but also many which were of marginal interest. Illumination engineering. The Soviet Navy. Rotating electrical machinery. Movie cowboys. (I hate Westerns.) Xerography. It becomes worthwhile to pick up books you might open, someday, if only to look up an explanation of pitcher plants or Douhet's theory of air power.

Of course, a limit is reached when you hit the number you can carry with one hand. The next book costs much more. (Actually, they were offering two hands' worth for eight bucks.) So, having scooped up a large number of tomes, you begin to sort them. I use three categories: Books I Must Have (five or six on this expedition), Books I'd Like To Have (about fifteen), and Books I Don't Much Care About (maybe another fifteen or twenty). I discard volumes from the third category until I reach the number my wallet-- or, in the Lafayette adventure, my arms-- can stand.

Little did the bookstore, and my friends, know that I had a secret weapon. Many years ago, I had a heavy library habit, keeping two branches of the Miami Public Library busy. On top of that, every now and then I'd hop a Coral Gables bus to downtown Miami for a raid on the Main Library. I'd check out a month's worth, about twenty books, and out of sheer necessity I developed a method for getting them to the bus stop a couple of blocks away.

First take all the oversized "coffee-table" books and stack them together. Then take the standard trade editions and stack them in two piles, side by side, upon the big ones. Paperbacks go on top. You can just fit this assembly under your arm, with the edge of the bottom book resting against your ribs or upon your hip, and with your hand clutching its opposite edge. This leaves your other hand completely free to fumble for change or to open doors.

If you have friends to open doors for you, you can fill both arms with books.

Jim and Cathy had picked up a few volumes; I invited them to add them to my collection. Total came to thirty-five, once I had discarded the meatball books and added Modern Soybean Production to give me a needed second coffee-table base. I've no interest in soybeans, but it did have lovely color photographs. It was useful to have my friends slip a few more in under the elbows once I had loaded up both stacks. Then it was a simple matter of climbing the stairs out of the basement and strolling casually up to the cash register. "Two hands' worth, please."

The Hoosiers behaved in a gratifyingly astonished manner. Perhaps they're still talking about me in that store; I like to think so. They didn't have any large bags, and it took five middle-sized ones to hold my booty. I drove into the sunset.

Sure, She's A Little Hard to Steer, But You Gotta Admit The View Is Terrific

"The cockpit has been redesigned and a one-piece windshield and nose-wheel steering system have been incorporated."

--Robert R. Ropelewski, "Skyfox Modifies T-33 Trainer for Export," Aviation Week, 23 May 1983

Mailing Comments

Greg-- "...had to bring along a house organ photographer..." For a special occasion like that, they could have gotten a theatre organ photographer.// Another anniversary: Syncom I, grandaddy of all Hughes comsats, was launched on 26 July 1963.// Altitude effects are usually folded into Mach numbers. A plane that will do Mach 1 at 50,000 feet won't necessarily be able to fly either at the same absolute speed or at the same Mach number when it's down at sea level.// Re Ishercon: "I'm also not sure I can handle sixty people in one house for four days..." Speaking from wide experience, I can tell you that it's much easier if it's not your house.

You get 340 quintillion joules, worth 4.3 trillion dollars, as the energy cost of the 500-tonne Daedalus payload. But Daedalus is a multistage rocket, so lots of the first stage's energy, for example, goes into speeding up the second stage, and only a small amount into the payload's kinetic energy. So integrated over the whole boost period, the energy cost is prodigiously larger than just the KE the payload finally gets. Wish I had time to figure this out, instead of rushing this to a deadline. Maybe a factor of 100? This is what I glossed over as "inefficiencies" in "Turbulent Ether" (see Apa-Tech 21).// I think Alice's first (splendid) cover for QuintSing already had the last word on your bedtime stories.

Rod-- Your question about long-lived electronics is intriguing. I don't think a thousand years is unreasonable to shoot for, given lots of R & D. Your power source must have lots of fuel, as well as enough spare parts to meet wear and radiation damage problems. It would probably have to be rebuilt from scratch every century or faster, unless you had, say, an array of brand-new reactors in mothballs. How long will your O-rings last, even just sitting on your spares shelf?

Computer systems can be built using multiple redundancy: several CPUs that perform the same calculations simultaneously. If they vote on the result, and order repairs on any CPUs that don't agree, probability of failure can be made very low. There are details to this scheme that are tricky; what if there's a stuck bit in the lines the CPUs use to talk to each other?

Self-repair provisions are essential. You need some kind of robot which can repair or replace all vital parts of the system. And you need more than one copy, so that a broken robot can be repaired. The Daedalus reference design has two, but greater numbers have been considered.

Is the Percheron II the same as that plug-nozzle ship pictured in Gary Hudson interview that Greg published a couple issues back?// I disagree strongly that "The problem with NASA is that they always ask for exactly what they want. The politicians aren't used to that." This is a very naive view. NASA is quite adroit at playing the Washington Budget Game, and they've played it with many successes since the agency was founded. See David Baker's exhaustive history Manned Space Flight for corroborative evidence. The NASA folks make a careful judgment every year concerning what they think they can get away with; some years they guess right, and some years they are pared down.// Re ham licenses: *sigh* Of course you're right. But it always seems to be so far down in my queue...

Jamie-- Our cartoons are on your office door? Wow! the Big Time!// I'm disinclined to believe any stories purporting to name the "real" Murphy behind Murphy's Law-- especially when they come from the ebullient Doctor Forward. I've heard too many different versions.// Sheffield's "McAndrew balanced drive" stories feature an interesting gimmick, but the drive demands stupefyingly massive ships, and I doubt whether any forseeable power source could run them. What gas mileage would your car get if you had to carry a neutronium cinder block in your trunk? //Re taping daytime NPR: I've heard that it's not wise to start the motor with the tape heads engaged, as they would be you left your machine on "record" and turned it on with a timer.// Yeah, I know the NASA folks pronounce TDRSS "teedris"; but I've gotten into the habit of calling it "Tardis"...

Dick-- Now that I've given Leah Zeldes my money, there had better be a "Genuine Confusion" next year.

Bonnie-- You teethed on Star Trek? Must be a younger generation. My tastes in SF were already formed when I saw the show for the first time. I remember watching people use the transporter and thinking, "You can't teleport without a receiver!"

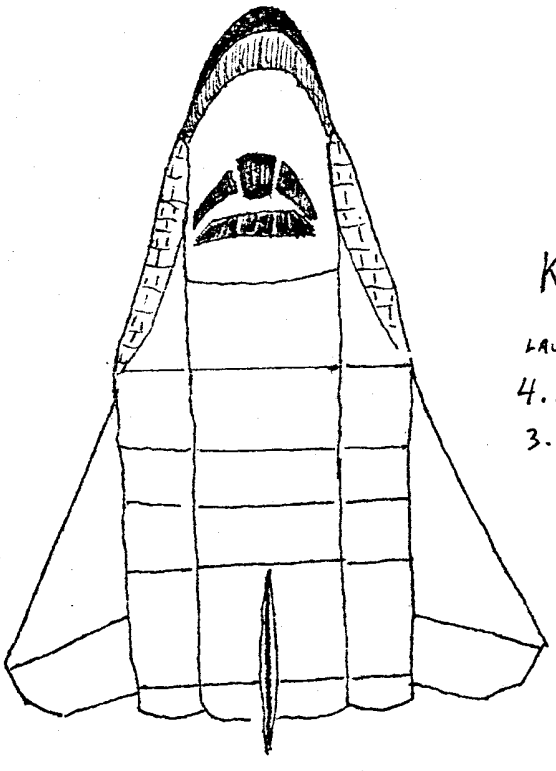
Renee-- I only met Earl a couple of times, but he did make an impression on me. When he died, I signed a sympathy card, but you're right-- I felt uncomfortably that I should do or say something more, yet there seemed no appropriate action to take. Not for a casual acquaintance such as myself. // Let us know more about the Halley's Comet Fund.// How does Marty make his Sieve of Eratosthanes run faster? Does he make the holes bigger? Smaller?// Re Tiny C: in his salad days our own Dick Smith wrote a Tiny Lisp for the 8080. Ask him about it.

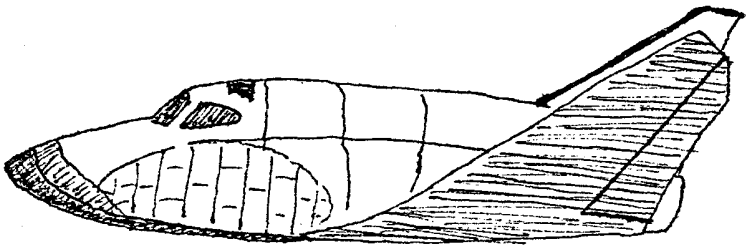
Midget Communist Bathtubs In Space

Those sneaky Australians have done it again. On 15 March the Soviets launched their second scale model of the Kosmolyot winged spacecraft. After one orbit, it splashed down in the Indian Ocean, and recovery ships steamed to pick it up. A snooping Royal Australian Air Force P-3 took many closeup photos of the operations. After all, in international waters anybody can take all the pictures he wants, right?) The 6 June issue of Aviation Week features the best of these pictures, and reveal lots of detail about the vehicle.

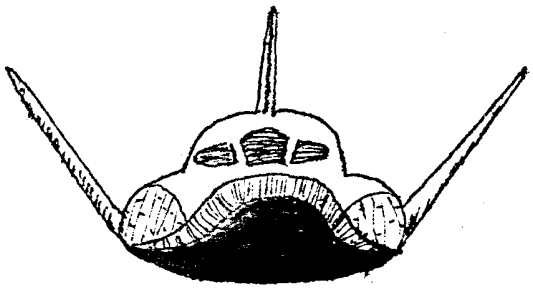
The model is estimated to weigh about 2000 pounds. I don't have on hand an estimate of the adult Kosmolyot's weight, but it is expected to carry a payload of around 10,000 pounds to low Earth orbit, so I'd guess a loaded weight of maybe 30,000 pounds. This compares with the Shuttle's payload of 65,000 pounds and an Orbiter launch weight of 150,000 pounds. There is slim evidence (which our DoD hasn't given us) that the Soviets are also working on a recoverable heavy-lift spacecraft with about twice the Shuttle's payload.

Here are drawings of the model Kosmolyot. Unlike the Shuttle or Dyna-Soar, it does not resemble an airplane with distinct fuselage and wings; instead it has a "lifting-body" shape much like the HL-10 or X-24 test vehicles of the 1960's. There are small winglets, though, and a central tailfin. Location of the crew cabin is apparent; there seems to be room for three engines, though two or more are possible in the fatter center section. I suppose we can expect to see the real thing flying before the decade's end...





KOSMOLYOT
TEST MODEL
LAUNCHED 15 MARCH 1983
4.3 M LONG?
3.4 M WIDE?



HIGGINS